THE USE OF INFORMATION COMMUNICATION TECHNOLOGY IN SUPPORTING LEARNERS WITH VISUAL IMPAIRMENTS IN SPECIAL SCHOOLS

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SUMMARY

The use of Information and Communication Technology (ICT) has an immense potential to improve the support needs of learners with visual impairments as well as their self-sufficiency and self-reliance. In the last nine years, the South African government introduced inclusive education, through White Paper 6 that requires that Learning, Teaching and Support Material, including ICTs be provided to learners with visual impairments. The provision of Assistive Technology devices (ATs) is essential to learners with visual impairments' full involvement in learning through the use of ICTs. Furthermore, literature indicates that many studies were done in the use of ICTs in teaching and learning, specifically for learners with diverse visual impairments. Recommendations were also supplied by these studies on how and when to use ICTs in the teaching and learning of visually impaired learners.

The empirical research of this study revealed that ICTs are essential tools for visually impaired learners to enhance their learning. It also drew attention to the fact that despite the commitments of White Paper 6 schools for the visually impaired are not yet supplied with appropriate ICTs and educators are not adequately trained to apply ICTs in teaching and learning.

OPSOMMING

Die gebruik van Inligtings en Kommunikasie Tegnologie het geweldige potensiaal om die lewens asook die self bekwaamheid en self vertroue van leerders met gestremdhede te verbeter. Gedurende die afgelope nege jaar het die Suid-Afrikaanse regering inklusiewe onderwys geimplementeer deur Witskrif 6, wat vereis dat leer, onderrig - en ondersteuningsmateriaal, insluitend, Inligtings Kommunikasie Tegnologie aan leerders met gesigsgestremdheid voorsien moet word. Die voorsiening van tegnologies ondersteunende apparate (TOA) is noodsaaklik vir algehele betrokkenheid van die gesigsgestremde leerder by die leerproses. Verder het die literatuur baie studies gedoen is oor die gebruik van Inligtingskommunikasie Tegnologie in onderrig en leer, spesifiek gemik op leerders met verskillende gesigsgeremdhede en aanbevelings is gemaak in hierdie studies oor hoe en wanneer verskillende gebruike van Inligtings Kommunikasie Tegnologie op leerlinge met gesigsgestremdhede in die onderrig en leer toegepas kan word.

Die empiriese navorsing het aangedui dat Inligtingskommunikasie Tegnologie noodsaaklike vaardighede bevat wat die gesigsgestremde leerder se leer sal verbeter. Dit het ook die aandag daarop gevestig dat ten spyte van Witskrif 6 se verbintenisse, skole vir gesigs gesluid nog glad nie voorsien is van toepaslike Inligtingskommunikasie Tegnologie nie en dat ondervampers onvoldaende opgelei is om Inligtingskommunikasie Tegnologie toe te pas in onderrig en leer.

DEDICATION

This dissertation is dedicated to my two Sisters': Leleki and Dikeledi, both have since passed on. I wish you could have been around with us!

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ORIENTATION TO RESEARCH

1.1 INTRODUCTION

The arrival of democracy in South Africa in 1994 ushered in uplifting changes within the South African education context. Given South Africa's dark Apartheid history, every policy intervention post 1994 had to ensure that a human rights culture prevails. The South African Constitution (Act 108 1996) guarantees common citizenship on the general values of human dignity to all its citizens. Consequently, the Constitution embodies the Bill of Human Rights which clearly spells out the right of everyone in so far as basic education is concerned. The Constitution also places a special burden on the fundamental right to basic education by committing the state to quality education and non-discrimination. These clauses as found in the Constitution of South Africa are significant as they protect all learners including those who are disabled (SA, 1996). In keeping with the Constitution, the National Curriculum Statements (NCS) also are sensitive to issues of disabilities (DoE, 2004:46).

Inclusive Education, through the publication of the policy document Education White Paper 6 on Special Needs Education: Building an Inclusive Education and Training System (DoE, 2001:16) set out to create a single education system for all learners, including learners who experience barriers to learning within a twenty-year period. White Paper 6 was launched in July 2001 and was a result of many investigations and reports.

However, the South African Constitution and the Bill of Rights have a direct effect on this policy which holds fast to the notion of a rights culture, embracing the democratic values of liberty, equality and human rights implying an education system that is inherently capable of meeting the diverse needs of every learner and of preventing learner breakdown and exclusion (SA, 1996). The South African Schools Act (SASA), Act 84 of 1996 (SA, 1996) also asserts the right of equal access to education for all learners without discrimination in

any way. No learner may, therefore be denied access to education on any grounds including disability, language or learning difficulty. The Salamanca statement which was signed in 1994 by 96 countries, including South Africa (Donald, Lazarus & Lolwana, 2006:23), states that "*Inclusive education systems must recognize and respond to the varied needs of their learners, accommodating both different learning styles and rates of learning and ensuring quality education to all through appropriate curricula, organisational arrangements, teaching strategies, resource use and partnerships with their communities*". An inclusive education and training system should uncover and address barriers to learning, as well as acknowledge and accommodate the variety of learning needs (SA, 2001:45). During the practices of an inclusive training system a vital role of the educator is to accommodate this diversity of needs in the classroom where every learner feels valued, safe, and cared for (SA, 2001:18).

Engelbrecht and Green (2001:18) declare that active participation by educators will shape inclusive learning within communities if educators offer combined learning opportunities and interactive support to all learners. The South African education system (SA, 2001:18) should provide the structure and flexibility to accommodate these diverse needs of all learners. However, it is also vital to observe that our world and our schools are changing and that Information Communication Technology (ICTs) is central to this change. Brodin and Lindstrand (2003:71) assert that digital media has revolutionised the information society. The advances in ICT have dramatically changed teaching and learning and have also expanded new learning opportunities and access to educational resources beyond those traditionally available. This is in relation with a changing environment and globalization that brings different educational needs (Van der Westhuizen, 2002:6). However, for all this to happen, educators need to be aware of the potential of ICT opportunities for learning and should become knowledgeable and experienced in the use of the technology for teaching (Selinger, 2008:1). The educators' role within an ICT-rich environment must necessarily change so that they modify their learning and teaching methods in order for learners who experience barriers to learning, including visually impaired learners, can be catered for. These

learners will then be able to learn in the best way they can. If this is the case, educators will recognise different learners' needs, and as such can support such learners in making choices about how and where they access new knowledge for their learning purposes (Selinger, 2008:1).

The White Paper on e-Education (DoE, 2004:16) states that ICTs encourage a teaching and learning environment which recognises that people operate differently, have different learning styles and have culturally diverse perspectives. ICTs embrace inclusive education by providing added opportunities, alternative methods of instruction and flexible assessments for learners who experience visual impairments.

Since ICTs are especially applicable to learners who are visually impaired this study will focus specifically on how ICTs are used in supporting learners with visual impairments in special schools. It is quite obvious that ICTs can make the teaching of these kind of learners so much more comprehensive as it addresses many of their specific needs (Florian & Hegarty, 2004);. By doing so these learners will have many more probabilities to improve and enhance their learning opportunities. However, many educators who are teaching visually impaired learners are not trained in using ICTs appropriately (Florian *et al* , 2004; Wilson–Strydom, Thompson, & Hodkinson–Williams, 2005; Annable, Goggin & Stienstra, 2007).

The South African Institute for Distance Education (SAIDE) undertook an extensive research project to investigate the use of ICTs for teaching and learning in South African schools during 2002 and 2003 (SAIDE, 2003). The findings of this research are that ICT projects do not succeed in schools because educators and learners of ICTs are often not properly trained on what ICTs can do or cannot do (SAIDE, 2003). These findings are also applicable to schools for the visually impaired.

In order for ICT projects to succeed during teaching and learning, ICTs' roles need to be considered together with how teachers integrate teaching strategies

that support each role within the curriculum. This can only be possible when educators are properly trained on its use (Selinger: 2008:1).

Nkosi (2007) also did a study on integrating technology into the learning and teaching practice. Among her findings was that the integration of ICTs into the curriculum demand empowerment of educators. However, she also found that educators lack computer technology skills and consequently there is a great need for intensive training of educators on computer technology and the various softwares which are available for educators in various learning areas and subjects. These findings are also applicable to schools for visually impaired learners.

According to Freire, Linhalis, Bianchi, Fortes and Pimentel (2010:866), the use of ICTs and e-learning has brought a high number of changes to supplementary educational resources. For instance, the use of ICTs, like integrated White Boards (IWB) for the teaching of visually impaired learners has been reported by a number of research studies (Gillen, Staarman, Littleton, Mercer, & Twiner, 2007). Gillen *et al*, (2007) investigated educational practices around the IWBs in British primary schools. The results of this investigation are examined in the light of technological activity and educational activity. In terms of the technological activity, the IWB facilitated speedy and smooth presentations of learning content towards visually impaired learners. In terms of educational activity, the use of IWB reinforced a traditional style of teaching where there was more interactive and non-authoritative dialogue between educators and visually impaired learners.

Mohon (2007), Schmid (2008), Glover, Miller, Averis and Door (2007) as well as Kennewell and Beauchamp (2007) reached the same findings: IWBs promote synchronous interaction between learners, educators and other stake holders involved in the learning process.

There is enough evidence that ICTs can support learning in a number of ways (Mumtaz, 2000). The use of ICTs can, for example, facilitate communication between educators and learners, increase access to information, provide

greater access to learning for learners (including learners with visual impairments) and generally motivate all learners, develop problem solving capabilities and aid deeper understanding. Selinger (2008:2) asserts that for learners who are visually impaired, the use of ICTs can provide access to learning in new ways which for many were previously inaccessible.

1.2 STATEMENT OF THE PROBLEM

The problem that was identified for purposes of this study was whether educators who teach learners with visual impairments in schools for the visually impaired have the knowledge and skills to use ICTs to enhance learning opportunities for these learners. The following research questions were thus asked:

- What are the educational needs of learners experiencing visual impairments within an inclusive education system?;
- Which ICTs are suitable for learners who experience visual impairments?
- How can both the learner and the educator in a school for the visually impaired use ICTs in the process of teaching and learning?;
- In what way can the use of ICTs enhance learning for learners' experiencing visual impairments?;
- Are educators of schools for the visually impaired trained to use ICTs for visually impaired learners?; and
- What recommendations can be made regarding training of educators in Schools for the Visually Impaired learner in the use of ICTs in teaching and learning?

1.3 THE OBJECTIVE OF THE RESEARCH

The main objective of this study was to determine if educators who teach learners with visual impairment in schools for the visually impaired have the necessary knowledge and skills to use ICTs in enhancing learning

opportunities for such learners. This main objective was operationalised in the following sub aims:

- To determine what the educational needs of learners experiencing visual impairments within an inclusive education system are;
- to establish which ICTs are available for learners who experience visual impairments;
- to determine how both the learner and the educator in schools for the visually impaired can use ICTs in the process of teaching and learning;
- to investigate how the use of ICTs can enhance learning for learners who are visually impaired;
- to ascertain if educators in schools for the visually impaired are trained to use ICTs for the visually impaired learners; and
- to construct recommendations regarding training for educators in schools for the visually impaired in the use of ICTs in teaching and learning.

1.4 RESEARCH DESIGN

1.4.1 Literature study

To achieve the goal of determining the availability and use of proper ICTs regarding teaching and learning of learners with visual impairments within an inclusive education system, a comprehensive literature study has been conducted to ascertain a thorough theoretical foundation for the study. To achieve this, most available databases like EBSCO HOST, search engines like Google, catalogues of other libraries has been used to locate sources of information. The following key words have been used during the search process:-

- Inclusive Education;
- visually impairment; and
- Information Communication Technology.

1.4.2. Research method

It must be stated that both qualitative and quantitative 'tactics' can be used in research studies (Leedy & Ormrod, 2005:133). Qualitative research tactics or approaches are recognized by the statistics that is spoken and quantitative research tactics deal with statistics that are numerical. In this study, a qualitative approach will be followed.

Nieuwenhuis (2007:99 - 117) declares that in qualitative studies, researchers frequently translate viewpoints which means that qualitative researchers do not believe that there is one absolute truth to be researched. They believe that:

- there are numerous truths or experiences which vary across space and time;
- researchers' humanness and social knowledge influence their understanding of their research;
- individuals give meaning to phenomena;
- lives of individuals can only be understood from within or from their personal experiences; and
- the exceptionality of a common situation affects the meaning that individuals make (Nieuwenhuis, 2007: 99 - 117).

The qualitative method was chosen as being the most relevant and suitable for examining the use of Information Communication Technology (ICT) in supporting learners with visual impairments in schools for the visually impaired in the Gauteng province, which is the aim
of this study. According to Leedy *et al.* (2005:139) one of the features of qualitative research is that it is interpretative and practical in character; i.e. the participants try to explain their opinions or feelings to the researcher (e.g. through responding to questions)) and thereafter the researcher records, analyses and interpret the responses from educators statements.

Other three main reasons account for this choice; namely:

- ❖ It is a multi-perspective approach to social interaction, aimed at describing, making sense of, interpreting or reconstructing interactions in terms of the meanings the educators who participated in the research, attach to it;
- ❖ it is a type of formative research that could offer specialised techniques for obtaining in-depth responses about the use of ICTs by educators in schools for the visually impaired, how they use ICTs, problems encountered in the use or availability of ICTs, educators and learners' needs and wants, as it is exploratory and interactive; and
- ❖ qualitative research provides a rich texture and context through which to learn about educators' use of ICTs in schools for the visually impaired without losing the rich descriptions of their attitudes and feelings and the essence of their experiences (Berg, 2003:5).

1.4.2.1 Phenomenological Study

In this study a phenomenological design was followed because the researcher wants to understand the views of educators who are teaching in schools for the visually impaired learners. A phenomenological study provides understanding of the impact / experience from the participants' point of view (Leedy *et al,* 2005:144).

A phenomenological design has the following characteristics:

- ❖ a phenomenon happens in a natural setting,
- ❖ the researcher assembles data directly from the participants who are in the sample; and
- ❖ conclusions are produced based on participants' perspectives (Leedy *et al*, 2005:139-140;144).

1.4.2.2 Sampling

Purposeful sampling has been used in this study. The nature of sampling is based completely on the verdict of the researcher in that a sample is

composed of elements which contain the most common characteristics of the population (McMillan & Schumacher, 2001:175). McMillan *et al* (2001:175) also refers to purposeful sampling as a method in which information-rich cases are selected in order to gain insight and understanding from which a great deal can be learned.

In purposeful sampling, it is important for the researcher to first determine the selection criteria to be used in choosing the participants. These criteria must reflect the purpose of the study and guide the process to be followed (Denzin, 2001:61).

A sample of thirteen educators (N=13) from two selected schools for the visually impaired in the Gauteng province were selected to serve as a sample for this research.

The researcher is employed by the Gauteng Department of Education, Vereeniging District Office where he works within an inclusive education unit. This unit supports special schools that accommodate learners with special educational needs, including visually impaired learners. It was therefore convenient for the researcher to choose the convenience sampling, where it was easy for him to find a group of selected participants on the basis of being accessible or expedient (McMillan *et al* , 2001:175). This gave him a better chance of interacting and interviewing participants who teach in special schools for visually impaired learners (Nieuwenhuis, 2007:79-80).

The criteria followed in selecting participants included the following:-

- educators should be qualified to teach in schools for the visually impaired learners;
- educators should be employed in schools for the visually impaired learners in Gauteng; and
- educators should be teaching classes that have visually impaired learners.

1.4.2.3 Data collection procedure

Data collection involves the specifications of procedures to be used in finding relevant reviews (McMillan *et al*, 2001:138). In this study, permission was requested from the Gauteng Department of Education's both Provincial and District offices for them to allow educators in identified schools for the visually impaired learners to voluntarily participate in the study. This permission was granted (see attached addendum D).

The researcher then phoned the two identified schools for the visually impaired to secure a meeting with all educators. Staff meetings were arranged through the respective school principals of the selected schools, and these meetings were held in the staff room of each school. In these meetings, the researcher addressed all educators regarding the aims of the study. Each identified school then elected one educator who was to serve as a mediator between the school and the researcher. All educators who volunteered for the study were given consent forms to sign. Every educator in each school who handed the consent form back identified a date for an interview. Such interviews were then held at each school on the identified dates. A special office space was made available for these interviews in each school.

Thirteen interviews were conducted in English and recorded using a tape recorder. One educator did not want to be recorded, but notes were taken during that interview session. All twelve interviews were transcribed verbatim and each interview has a script (see attached addendum B).

1.4.2.4 Data analysis

Data analysis involves bringing classification, arrangement and meaning to the collection of time consuming, creative and fascinating information to be processed (Marshall & Rossman, 1999:111).

During the data analysis, the researcher made use of the themes he had identified from individual interviews done with participants. These themes were from the respondents' description of their experiences. Unrelated information was separated from related information. The related information was then broken into phrases which reflect a single, specific thought. Such phrases were further grouped into categories that reflected the various aspects of meaning. The various meanings identified were then used to develop an overall description as given by the respondents (McMillan *et al*, 2001:464).

1.5 CONCEPT CLARIFICATION

1.5.1 Inclusive education

"Inclusion refers to accepting and respecting the fact that all learners are different in some way and have different learning needs which are equally valued and an ordinary part of our human experience" (DoE, 2001:16).

1.5.2 Visual impairment

It means blindness or low vision (EBSCO, 2008:6).

1.5.3 Information Communication Technology

ICTs represent the convergence of information technology and communication technology through the use of Assistive Technologies (DoE, 2004:15; c.f.3.2.2.).

1.6 CHAPTER DIVISION

Chapter One:	Orientation to research
Chapter Two:	Educational needs of learners experiencing visual impairments within an inclusive education system
Chapter Three:	Information Communication Technology and Inclusive Education

Chapter Four: Research methodology

Chapter Five: Data presentation, analysis and interpretation

Chapter Six: Conclusion and recommendations

1.7 CONCLUSION

This chapter presented the problem statement and its setting, the aim of this research and the methodology that was employed when the study was done. In the next chapter the review of literature on educational needs of learners experiencing visual impairments within an inclusive education system is presented.

CHAPTER 2

EDUCATIONAL NEEDS OF LEARNERS EXPERIENCING VISUAL IMPAIRMENTS WITHIN AN INCLUSIVE EDUCATION SYSTEM

2.1 INTRODUCTION

The use of Information Communication Technologies (ICTs) or computer-based systems to support teaching and learning has been a long- term field of research (Freire, Linhalis, Bianchini, Fortes, & Pimentel, 2010:867). Kennewell and Beauchamp (2007:227) estimate that studies on this matter were started 35 years ago. To the question of what difference does ICTs make to learning, no simple answer was yet found. According to Kennewell *et al* (2007:227) it is clear, however, that the influence of ICTs on learners' achievements importantly depends on the educator, the educational approach adopted, the ICT resources used, as well as the objectives intended.

Before the inception of inclusive education internationally, most learners who experienced barriers to learning, including, those with visual impairments, were excluded from mainstream schools in South Africa and were educated in special or specialized schools (Swart & Pettipher, 2005:20). These learners had special curricular and most of the time did not have the opportunity to achieve a mainstream matriculation certificate. This hindered them from entering tertiary education institutions to be able to continue with their academic studies.

Since 1994, South Africa accepted that all learners who were previously marginalized due to separate education systems of the time needed to be integrated into one system, irrespective of their disabilities or race in order for the country to realise an inclusive education system (DoE, 2001:11).

The focus of this study is on the needs of the visually impaired learners and the use of Information Communication Technologies (ICTs) within an inclusive education system. However, to provide a comprehensive understanding of the

given research questions a brief explanation of inclusive education and the implications thereof for the visually impaired will be discussed. It is also important to first have knowledge of visual impairment so as to be able to understand what the educational needs of learners suffering from suchimpairments. Ideally, ICTs need to be able to address these educational needs. This will therefore be discussed in the following chapter.

2.2. INCLUSIVE EDUCATION IN SOUTH AFRICA

Education White Paper 6: Special Needs Education: Building an Inclusive Education and Training System (WP6) (DoE, 2001) was accepted in 2001 as the legal policy on inclusive education in South Africa. WP6 defines inclusive education as follows (DoE, 2001:16):

- All children and youth can learn and all children and youth need support;
- accepting and respecting the fact that all learners are different in some way and have different learning needs which are equally valued and an ordinary part of our human experience;
- enabling education structures, systems and learning methodologies to meet the needs of all learners;
- acknowledging and respecting differences in learners whether due to age, gender, ethnicity, language, class, disability or HIV status;
- broader than formal schooling and acknowledge that learning also occurs in the home and community, and within formal and informal modes structures;
- changing attitudes, behaviour, teaching methodologies, curriculum and the environment to meet the needs of all learners;

- ❖ maximising the participation of all learners in the culture and the curricula of educational institutions; and uncovering and minimising barriers to learning; and

- ❖ empowering learners by developing their individual strengths and enabling them to participate critically in the process of learning (DoE, 2001: 16).

Inclusive education, in other words, should be a system of education wherein all learners, including learners with barriers to learning, such as learners with visual impairments are taught together with their sighted peers in one school, in one environment, under one curriculum and by the same educators as well as under one roof (DoE, 2001:16).

Within inclusive education no learner is discriminated against due to a learning barrier (Naicker, 2004:14), meaning that learners with visual impairments can be taught in a mainstream school together with their sighted peers. This implies that schools that enroll visually impaired learners have to make adaptations to their curriculum and to their environment and these can probably be done in the context of e-learning environments wherein learning and teaching of the visually impaired learners can be enhanced (Freire *et al*, 2010:867).

Donald, Lazarus and Lolwana (2006:20) describe the practice of inclusive education as a '*broad truth-seeking and ethical position in relation to the educational rights of all children'*. Towards the end of the 20th century, international agreements were reached on inclusive education as a worldwide philosophy of education (Thomas, Walker & Webb, 2002:4). However, even if inclusive education is a global movement it is still culturally determined and essentially depends on the political values and processes of the state for its action or inaction (Booth, Ainscow, Black-Hawkins Vaughan & Shaw, 2000: 256).

Engelbrecht (2006:256) states that in South Africa inclusive education is viewed as a proper philosophy of education that promote the '*full personal, academic and professional development of all learners, irrespective of their race, class, gender, disability, religion, culture, learning style and language'* The central theme of inclusive education in South Africa is to protect the rights of learners with 'special educational needs' i.e. learners with disabilities like visual impairments so that they have access to education that addresses and responds to their needs, thus ensuring quality education for all (DoE, 2001:18). This was in contrast with the previous apartheid education system where separate policies existed for 'special' and 'mainstream' schools. Education White Paper 6 (DoE, 2001): as an educational policy in South Africa changed these old policies and declares that everybody is entitled to the same education. In South Africa, inclusive education is framed within a human rights approach, transforming the human values of integration into the immediate rights of previously excluded learners (Engelbrecht, 2006:256).

Wildeman and Nomdo (2007:01) assert that inclusive education requires that all education programmes openly tackle any barrier to learning that learners can experience in their wide-ranging medical, social and economic sense. Mda and Mothata (2000:15) affirm that this also commits all stakeholders to ensure access and provision of education to every learner, including learners experiencing barriers to learning.

Although the ideal of White Paper 6 is to include learners who experience barriers to learning, such as visual impairments, in mainstream schools wherein they can learn with their seeing peers in one classroom with one curriculum and one teacher (Shevlin & Moore, 2000:290), the reality scenario is that these learners are still accommodated in specialized schools, where specialized physical and human resources are supposedly available.

2.3 NEEDS OF EDUCATORS IN SPECIAL/SPECIALISED SCHOOLS

Three assessment studies were done in Gauteng and the Western Cape to determine teachers' approach towards inclusive education. The following

challenges were identified (Swart, Pettipher, Engelbrecht, Eloff, Oswald, Ackerman & Prozesky, 2000):

- inadequate knowledge, skills and training of educators to implement inclusive education;
- lack of educational and teacher support; and
- inadequate provision of facilities, infrastructure and assistive devices.

The above challenges can be alleviated if the needs of educators in special/specialised schools are met. Below is a discussion on the needs of educators teaching in special/specialised schools, including educators in schools for the visually impaired learners.

2. 3.1 Training and skills

Swart and Pettipher (2005:20) affirm that the Department of Education depends on educators to successfully implement inclusive education. Therefore, specific, adequate pre- and in-service training for these educators who will be directly involved with learners with special needs is essential. Educators require a shared common framework and adequate skills to successfully implement inclusive education for all learners who experience barriers to learning.

2.3.2 Lack of educational and teacher support

Sukhraj (2006:3) states that district officials who are employed by the Department of Education to support special and specialised schools, as well as mainstream schools are also poorly trained on inclusive education. Consequently, it is also difficult for them to support educators in schools for the visually impaired learners.

2.3.3 Lack of resources

For inclusive education to be successful, human resources, Learning and Teaching Support Material (LTSM), as well as physical and financial resources are vital. Human resources would include disciplines such as psychologists, speech, occupational and remedial therapists. LTSM and physical resources refer to proper buildings and equipment such as Braille, walkers, hearing aids, ICTs and many more aids (Dinkebogile, 2005:79).

In order to prepare educators for teaching learners with visual impairment, Hughes (2001:289) asserts that the following should happen:

- workload of educators should be minimized;
- more time for tuition is needed;
- there should be little bureaucracy;
- resources (human and finances) should be offered ; and
- support should be given to schools for the visually impaired.

If the above factors are not addressed in schools for the visually impaired, the impression can be that educators did not as yet make the paradigm shift towards inclusion, meaning educators are not well prepared for inclusive education, particularly of visually impaired learners.

The implications of inclusive education for the visually impaired are discussed below:

2.4 IMPLICATION OF INCLUSIVE EDUCATION FOR LEARNERS WITH VISUAL IMPAIRMENT

Before the introduction of inclusive education, learners with disabilities were categorized according to their ‘observable medical’ conditions. This reflected the medical model which viewed their difficulties in learning as produced by personal deficiencies e.g. visual impairments (Muthukrishna, 2000:69). According to Muthukrishna (2000:69) with the introduction of inclusive education, the shift from observable medical deficiencies to a more social-ecological paradigm occurred. Inclusive education brought the focus to the

identification of barriers to learning for all children as well as the mobilisation of inclusionary resources within learners, teachers, communities and government. Within the socio-ecological framework difficulties in learning are seen as arising out of an interaction between learners and the human and material resources available to support learning and not as a problem within the child. From this perspective, a core task in education is to maximise participation for all learners through minimising all barriers to learning in the system. The development of a pedagogy of inclusive education is a key element of this task (Muthukrishna, 2000:69).

In the previous medical model, for example, a learner with visual a impairment was classified as having a deficit. This meant that visually impaired learners could not be taught the same curriculum, in one school, under one roof together with their mainstream peers. This gave the perception that the deficit (visual impairment) was the primary characteristic of such a learner, and being a person a secondary characteristic (Muthukrishna, 2000:69).

This medical approach to impairments gave rise to the view that children with special needs are the artifacts of the traditional curriculum (Muthukrishna, 2000:70). The medical model of impairment views the disabled person as needing to fit into society rather than thinking about how society itself should change. The shift from the medical model (that promoted segregation) to a social model (that led to integration) enabled better implementation of the philosophy of inclusive education as mentioned in White Paper 6.

Muthukrishna (2000:70) declares that the way forward must be to focus on improving and reforming schools and in so doing develop forms of teaching that respond positively to learner's diversity. "*Teacher education should be organized around a curriculum that confronts issues of inclusive teaching rather than the management of individual problems through exclusive individual and special education paradigms"* (Muthukrishna, 2000:70).

Moore (2003:1) affirms that the socio-ecological model represents a combined relationship between people and their environment. Moore (2003:1) conducted

a study wherein the relationship between visually impaired learners, the curriculum, educators and communities was investigated. Moore (2003:1) concluded from this study, that while the community should dictate changes that will benefit visually impaired learners, changes should be aligned to visually impaired learners' needs and their social environment. Through this relationship of community involvement, lives of visually impaired learners can be bettered because adaptations to the better will have been made in both teaching and learning. The most effective approach leading to improved lives for learners with visual impairments is a combination of efforts at all levels i.e. learners with visual impairments, schools, community and public policies (Moore, 2003:1).

Rieser and Mason (1992:13) have compared the medical and the socio-ecological models and indicated the implications for education of each way of thinking. This is illustrated in Table 2.1 below:

Medical model	Socio ecological model
Deficit-in-the-learner (e.g. a learner with a visual impairment is not able to cope with mainstream learning)	A learner is valued (improvements are made so that a learner with a visual impairment can learn like any other learner.)
Diagnosis – a child is tested and categorized according to the findings	Strengths and needs are defined by self and others. Therefore the focus is not on the deficits and problems, but on what the learners is able to achieve.
Labeling - a child is classified according to his visual impairment.	Barriers to learning are identified and solutions are developed
Impairment becomes focus of attention (e.g. visual impairment is seen as the barrier)	Outcomes-based programs are designed. The curriculum is learner focused and focuses on the learners' strengths and needs.
Assessment, monitoring	Resources are made available
Segregation and alternative services (learners have a visual impairment, therefore they will not	Training for parents and professionals (everybody is involved in making it possible so that learners with visual

learn better in mainstream schools)	impairments cope with their studies.)
Society remains unchanged (learners with a visual impairment belong to their own communities)	Society changes (the community embraces visual impairments and improvements are made to accommodate this barrier)

Table 2.1: Comparing the medical and social models of disability.

Since learners with visual impairments were segregated and excluded as highlighted in the medical model, the socio-ecological model brought an improved move towards acknowledging their strengths and assets as human beings. Below is a discussion on inclusive education for the visually impaired learners.

2. 5. INCLUSIVE EDUCATION FOR THE VISUALLY IMPAIRED

Bauer and Brown (2001:33) view inclusive education for the visually impaired learner as being the teaching and learning of visually impaired learners together with their non-visually impaired peers in one school and in one classroom under one roof. However, according to Naicker (2004:19) it means accommodating or improving tuition of visually impaired learners in whichever education setting. As defined by Naicker (2004:19), inclusive education for the visually impaired is "*a system of education that is responsive to the diverse needs of visually impaired learners"*. Montgomery (2001:4) affirms that inclusive education should improve the well-being of visually impaired learners in any setting.

Conversely, Foreman, Bourke, Mishra and Frost (2001:239) proclaim that inclusive education for the visually impaired learner will only be realized in a unified education system, wherein all stakeholders collaborate and are supported in creating learning that meets the diverse learning needs of all learners, including those who are visually impaired. Schools and communities should embrace visually impaired learners as full members of the group and

also value their presence. It is through such actions that inclusive education can be made a success (Farrel & Ainscow, 2002:3).

According to the Elton B. Stephens Company (EBSCO) (2008:2), the International Council for Education of People with Visual Impairment and the World Blind Union supports inclusive education as one of the alternative models of service delivery, on condition that all necessary steps are taken to first put in place the required number of educators trained in the special needs of blind and low vision learners as well as the essential support systems, the necessary equipment, Braille books, and low vision devices to guarantee true inclusion. The following advantages of inclusive education for learners with visual impairments are acknowledged:

2.5.1 Access to the common core curriculum

In an inclusive education system learners with visual impairments will have access to the same core curriculum as with any other learner in South Africa. This will open doors for them to the world of study and work after school. However, for this to succeed EBSCO (2008:4) insists that the following should be in place for these learners: the use of Braille systems; tape recording; services; large print; and other appropriate technologies. This must also be accompanied by appropriate support services by trained educators. It is also essential that learners with visual impairments be provided with optical devices such as magnifiers, microscopes, and tele-microscopes so as to be able to access near information and monocular telescopes and bioptic lenses for accessing distance information.

2.5.2 Assistive Technologies

As effects of recent technological advances, assistive technologies have come to the forefront of discussions surrounding the education of learners with visual impairments (Brandjes, 2002:10). Computer technology has made possible some of the assistive devices solutions as discussed in chapter 3.

2 5.3 Social benefits

The Indian Department of Education (2004:3) states that inclusive education can have the following advantages for learners with visual impairments. They can:

- enroll in regular classrooms and their special educational needs can be met in the mainstream school;
- attend neighborhood schools;
- have access to quality education;
- enjoy improved social development and academic outcomes;
- be treated and seen as social beings and not as learners with a medical issue; and
- form friendships with peers without visual impairments.

Cheminias (2002:47) affirms that other benefits of inclusive education for the visually impaired will be:

- Other learners will learn to accept learners with visual impairments;
- mutual respect between learners with visual impairments and all stake-holders can be improved;
- expectations for learners with visual impairments will be raised; and
- learners with visual impairments will be equally valued like any other learners.

The above mentioned benefits imply that within inclusive education learners with visual impairments will be free from discrimination and they will be provided with equal educational opportunities to learn what all learners in that setting are expected to learn (TASH, 2002: I). However, this will not be without challenges, which will also need to be acknowledged. These challenges are discussed below.

2.6 CHALLENGES OF INCLUSIVE EDUCATION FOR THE VISUALLY IMPAIRED

According to EBSCO (2008:2) one challenge faced by the United States is that there is an estimated shortage of more than 5000 adequately trained educators to teach trained learners who are visually impaired. This shortage is especially severe in rural areas (EBSCO, 2008:2). Sukharaj (2006:3). Wildeman and Nomdo, (2007:2) as well as Eloff and Kgwete (2007:352) affirm that the same challenge is of a serious concern in South Africa.

Another challenge of inclusive education as identified by Wildeman *et al.;* (2007:2) is that teachers at public schools do not understand the shift towards inclusive education as required by Education White Paper 6. For some educators inclusive education means the strengthening of special needs schools, while for others it means the complete overhaul of the education and training system (Wildeman *et al.*, 2007:2). This means that the Department of Education did not clearly explain the rationale behind inclusive education to its employees. This has implications for learners with visual impairments also, as there is no clarity regarding where they will be accommodated within the schooling system and also on how they will be supported.

According to Sukhraj (2006:3), the following are some of the challenges faced by the implementation of Education White Paper 6 in South Africa, which also have implications for learners with visual impairments :-

Clauses in White Paper 6	Challenges
There will be provision of a supportive Inclusive Education environment for learners with special needs	Education White Paper 6 is not evaluated, coordinated, implemented and monitored effectively, meaning learners who are visually impaired are still exposed to a different and inferior education than their sighted counterparts
Audit of special schools to ascertain what limitations exist and what improvements need to be made.	District Based Support Teams (DBSTs) are not properly constituted yet and many of the employment posts still remain vacant.

The Full Service Schools (FSS) are not admitting learners who are visually impaired (cf. 2.5.2.)	FSS will not be able to cater for needs of visually impaired learners as they don't receive the necessary support expected from the Department of Education
Learning, Teaching and Support Materials, training for remedial educators and support staff will be provided	No specifics stipulated on quantity, quality or exactly what types of facilities are provided for learners who are visually impaired

Table 2.2 Clauses in Education White Paper 6 and challenges faced by clauses (Sukhraj, 2006:3)

Another challenge presented by Wildeman *et al.* (2007:1) is the provincial funding of inclusive education in South Africa that has been influenced by the following factors:

- salary costs increased severely during the years 1996-1998, leading to a strenuous effort of controlling wages in public schools;
- there was a subsequent shift of funding priorities from personnel to non-personnel expenditures, which reduced the influence of inclusive education; especially given its new human resource challenges;
- the increasing priorities accorded redistributive policies in Grade R, further education and training colleges. This meant that the inclusive education claim for resources became less of a priority; and
- the delay in the implementation of conditional grants and the absence of funding norms and standards for special/specialised schools (Wildeman *et al*, 2007:1).

These priorities moved the implementation of inclusive education further down the list of priorities. Apart from funding, other challenges facing implementation of inclusive education in South Africa are:

2.6.1 Early Childhood Development (ECD)

Education White Paper 6 states that early childhood intervention is essential for all children, but even more so for the child who is visually impaired. Early infant stimulation and education need to begin for a child as early as 3 months (Sukhraj, 2006:3), which is applicable to visually impaired children too. Nine years after Education White Paper 6 was released, nothing has yet been initiated for the early childhood development of children with visual impairments. Sukhraj (2006:3) states that this does not auger well for a visually impaired pre-school child whose parents might find that they have to send him or her to a mainstream school with no educator trained to help properly prepare him or her for primary school.

2.6.2 Full-service schools (FSS) and mainstream schools are not prepared

Eloff *et al.*.(2007:352), Sukhraj (2006:3), as well as Hay, Smit and Paulsen (2001:214) declare that adequate training of educators to teach learners with varying disabilities in FSS and mainstream schools is still lacking. Despite a lack of trained educators there are also educators frustrated with inclusive education, because they do not receive the support promised by the department. Another complaint is that education department officials are not accessible to provide them with the much needed support.

Wildeman *et al*, (2007:3) found in their research that provincial departments of education did not conceptualise a strategic campaign and integration strategy for the inclusion of marginalised children and learners with disabilities. Consequently, in cases where learners with disabilities were mobilised to FSS or mainstream schools, provincial departments did not have the requisite resources (financial, physical and human) to provide for their diverse learning needs. Some public mainstream primary schools having learners with special needs were converted into full-service schools (FSS) and some special schools into resource centres. These selected schools' infrastructure do not meet the criteria developed for site selection, for an example, some ramps

have been built at FSS, but simple adaptations like Braille boards for directions, which are required to make physical environments more user friendly for learners who have visual impairments have not been done (Sukhraj, 2006:3).

2.6.3 District Based Support Team (DBST)

White Paper 6 (DoE, 2001:47) declares that there must be District Based Support Teams with adequately trained support personnel. However, according to Sukhraj (2006:3) there are currently, within DBST's, no Braille educators or any educators with knowledge on how to support educators who have learners with visual impairments. As a result of continuous restructuring many educators are placed at specialised schools, such as schools for the visually impaired, with no specialised training. Since Wildeman *et al.* (2007:3) emphasize that DBST's are not a reality in provinces no training and support for these teachers can take place. This has very negative educational implications for learners with visual impairments who need specialised teaching and support.

Key personnel in DBST's must therefore be employed according to specialised needs otherwise quality education for learners with visual impairments will remain a pipe dream.

2.6.4 Social conditions

Sukhraj (2006:3) states that many schools are exposed to violence on the playground which can have serious consequences for learners with visual impairments, since many learners with disabilities are often exposed to bullying. Many teachers and learners are also not trained on how to deal socially with learners with visual impairments and many times find it uncomfortable.

2.6.5 Conclusion

Eloff *et al* (2007:352) proposes the following different ways to support teachers in coping with the challenges of an inclusive classroom, which can also be to the advantage of learners with visual impairments:

- Introduction of task forces, long-term studies, short-term studies, professional development, and even shorter-term payments;
- appropriate training (i.e. pre-service and in-service), as well as community and parental involvement;
- the Department of Education should be proactive, effective, and financially sound (Eloff et al, 2007:352; Hay, Smit & Paulsen, 2001:214).

To be able to understand the needs and challenges of visually impaired learners, in the following discussion a description of visual impairments will be provided and the specific educational needs of learners experiencing visual impairments in an inclusive education system will be addressed.

2.7 VISUAL IMPAIRMENTS

2.7.1 Definition

The World Health Organization (WHO) defines impairments as “problems in the body function or structure”. Persons with visual impairments therefore have problems with their vision. However, there are many aspects of “seeing” that one needs to be aware of: e.g. visual sharpness for distance and near objects from the eyes, field of vision, colour vision and adaptability to light (WHO, 2000).

According to Wendy (2003:1) in order to understand the definition of a visual impairment and legal blindness, it is important to know how eyesight is measured. Central vision is measured using an eye chart. The results are recorded as a pair of numbers called visual acuity. Normal sight is recorded as 20/20. The first number is the distance from the eye chart. The second number is the distance from which a normal eye sees a letter on the chart clearly.

Someone with a visual acuity of 20/20 can see certain sized letters at a distance of 20 feet. Someone with a visual acuity of 20/60 only sees letters at 20 feet that a normal eye identifies at 60 feet. The higher the second number of your visual acuity, the worse your vision will be (Wendy, 2003:1).

2.7.1.1 Legal definitions of a visual impairment

According to the American Academy of Ophthalmology (2004:2) the legal definition is based on visual acuity and field vision. A person whose visual acuity is 20 / 200 or less after the best possible correction with glasses or contact lenses is considered legally blind. This means that a person whose vision is restricted to an area of 20 degrees or less is considered legally blind.

Legal blindness does not necessarily mean that a learner or a child has no visual acuity at all; the child may be able to sense light and darkness and may have some visual descriptions. A child who scores between 20/70 and 20/200 on tests of visual acuity, with correction, is legally partially sighted or has low vision (Wendy, 2003:1). Jernigan (2005:1) states that, however, this is not really a satisfactory definition. It is rather, a way of recognizing in medical and measurable terms something that must be defined not medically or physically but in functionality.

2.7.1.2 Educational definitions of visual impairments

The educational classification of visual impairments are described as moderate, severe and profound and are not based on tests (Wendy, 2003:1), but rather on the special educational adaptations that are necessary to help the affected children to learn. As such the Individuals with Disabilities Education Act (IDEA, 1998) emphasizes the relationship between vision and learning in the education scenario:

- With a moderate or low vision impairment, an individual uses eyes as a primary means of learning. It can be improved with the help of visual

aids, either in the regular classroom or a reading laboratory which is equipped with ICTs;

- with a severe visual or functionally blind impairment a learner receives learning content primarily through hearing and is helped somewhat with visual aids. The child can still use vision as a channel of learning. This classification is equivalent to the definition of a child with low vision; and
- with a totally blind or profound visual impairment an individual receives no useful information through the eyes. For this learner, touch and hearing are the predominant learning channels. This classification is at the level of legal blindness.

In other words, IDEA (1998) confirms that an impairment in vision, even with correction, adversely affects a child's educational performance. Each eye condition has an impact on vision, therefore, the impact that a visual impairment has on learning is unique to every learner. The vast majority of learners with a visual impairment have some useful sight, although the degree of sight can vary greatly. For many learners with a visual impairment, reading and writing presents barriers to learning. These barriers inevitably result in difficulties in accessing and engaging the curriculum and technologies (IDEA, 1998:17).

According to Argyropoulos, Sideridis and Katsoulis (2008:221), "*a visually handicapped learner is one whose visual impairment interferes with his best possible learning and achievement, unless adaptations are made in the methods of presenting learning experiences, the nature of the materials used, and/or in the learning environment*". However, before adaptations are made, we should know the causes of visual impairments.

2.7.2. Causes of visual impairments in children

The WHO (2000) affirms that there are many causes of visual impairments (WHO, 2000). The following conditions can affect children from birth to age 5 and cause visual impairments. These conditions have changed over time as medical treatments evolved and new conditions arised that result from medical

conditions or complex premature births (American Optometric Association, 2007:8). The most common causes of visual impairments in children are listed below:

- ❖ retinopathy of prematurity (ROP): a retinal deterioration common in premature infants;
- ❖ glaucoma and cataracts: due to structural impairments;
- ❖ refractive errors: Myopia (nearsightedness) and hyperopia (farsightedness);
- ❖ cortical visual impairments-suspected damage to parts of brain that interpret visual information; and
- ❖ a visual impairment may also be caused by trauma or inherited eye disorders

(American Optometric Association, 2007:8).

2.7.3. TYPES OF VISUAL IMPAIRMENTS

2.7.3.1. Partial sight

The term 'partially sighted' is used to describe learners with a visual impairment, but can still read through their eyes (Mason, 1997:2). Partial sightedness extends from those with relatively minor visual difficulties to those who may be on the margin between print and Braille and who are sometimes described as having a low vision.

While medical causes of visual impairments are many, the functional implication for partially sighted learners is summarized under the following broad headings (Mason, 1997: 2):

- ❖ **Poor Acuity**

Poor acuity refers to sharpness of the whole image seen by an individual. Both distance and near vision are affected by poor sharpness. Some learners may be able to see quite small print on a page, but unable to see the blackboard,

while for others the opposite may be true (Mason, 1997: 2). The child with poor acuity will not clearly see what is written in a book which is near to him and will not see at all what is written on the chalkboard which might be a little bit further away (Mason, 1997: 2).

- **Central vision loss**

Central vision loss indicates a loss in the area of the visual field that is used for detecting fine details. Learners may be able to move around freely if the rest of the visual field is unaffected. These learners often experience difficulties with tasks involving reading, writing and close observation (Mason, 1997:2).

- **Peripheral vision loss**

Peripheral vision loss means that a learner experiences a secondary vision loss whereby they have a problem with moving around and locating objects. It can also present learners with difficulty in finding the 'space' to record their answers on a question paper or workbook (Mason, 1997:2).

- **Interrupted vision**

Interrupted vision means that a learner experiences a broken-up vision. This means there are irregular patches of poor vision that affect a learner's sight. In such an instance learners may have a longer time inspecting objects consciously through weak eyes in order to see them effectively. Complicated visual tasks may become impossible for these learners if they are able to pick up information only in disjointed fragments (Mason, 1997: 2).

- **Low contrast sensitivity**

Some visual conditions cause particular difficulties where an object to be viewed does not stand out clearly from its background. For such learners the lighting and colour scheme of the class environment will be especially

problematic. They may find the clarity and contrast of print on the page more important than its size (Mason, 1997: 2).

- **Adaptability to light**

Many learners with visual impairments will find obvious variations in light difficult to manage. Many find bright light painful (photophobia), while others may find it difficult to adjust visually when moving from a bright to a dimly lit area or activity (Mason, 1997:2).

- **Colour loss**

Mason (1997:2) asserts that colour loss on its own does not constitute a visual impairment, but it often accompanies and compounds other visual difficulties. The extent of colour vision loss varies between individuals, but the main educational implications remain the same: difficulty in distinguishing detail in pictures, maps and diagrams. This means that activities that are heavily dependent on colour-coding may present significant problems to learners with a severe colour loss (Mason, 1997: 2).

Mason (1997:2) declares that the majority of learners with visual impairments are partially sighted. However, since there are so many types of visual impairments their needs vary considerably. Many are able to work with normal print, but this apparent ability to cope often creates a significant difficulty for educators as it may lead to their very real needs being underestimated or overlooked since educators may think their eyesight is normal (Mason, 1997: 2).

For learners with partial visual impairments ICTs could be a very helpful tool to support their learning (c.f. Chapter 3).

2.7.3.2. Blindness

Learners who are ‘educationally blind’ have insufficient vision to access printed materials, relying instead on their senses, like hearing and touch (Mason, 1997:3). This means that such learners cannot see what is printed on written worksheets or on the chalkboard. They therefore rely on Braille. However, being educationally blind does not necessarily mean that a learner has no useful vision. Many Braille-reading learners retain some, although very little, vision, which may serve them well both in and out of the classroom, for close observation of practical work, for example, or for independent mobility (Mason, 1997:3).

Since there are quite a number of learners with visual impairments that need additional support and adaptations it is necessary to refer to the prevalence of such learners in South Africa.

2.8 PREVALENCE OF VISUAL IMPAIRMENTS

According to the National Population Census conducted in 2001, there are 259 286 children with disabilities in South Africa. (SA, 2001) These disabilities include children listed as having a “sight” disability.

Table 2.3 and Figure 2.1 provide the number of children with special needs in South Africa. Various types of disabilities affect these learners. The prevalence of hearing was the highest followed by sight, intellectual / mental disability and lastly physical disabilities (SA, 2001).

Type of disability	In SA (Ages 5 – 14)
Mentally	65,161
Sight	72,240
Hearing	72,783
Physical	49,102
Total	**259,286**

Table 2.3: Children with Special Needs in South Africa (Statistics South Africa 2004)

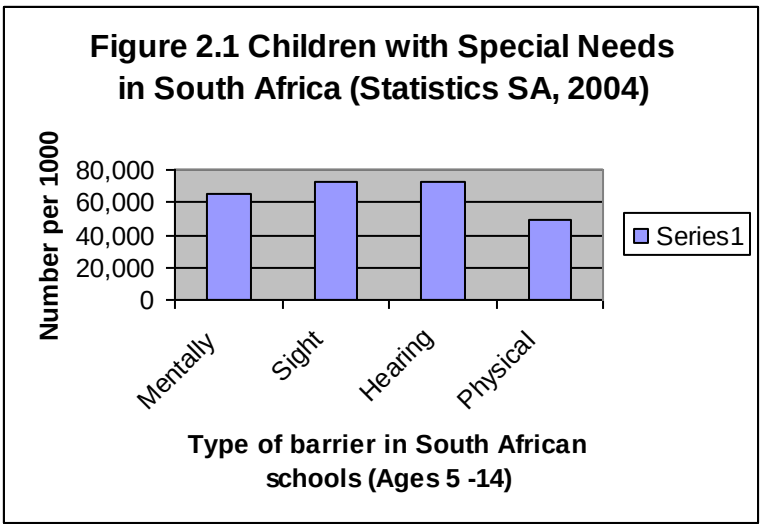

Figure 2.1 Children with Special Needs in South Africa (Statistics South Africa 2004)

It is obvious then that there are many learners with visual impairments in South Africa, whose specific learning needs must be addressed with the best possible teaching, including appropriate resources such as ICTs.

2.8.1 Prevalence in Gauteng

Since this study is conducted in Gauteng it is important to specify the prevalence here also. Among the 9 Provinces of South Africa, the Gauteng province has the highest number of people with visual impairments. This is indicated in the Table 2.4 below:

Province	Sight	Hearing	Physical	Mental	Multiple	Not specified	Total
Gauteng	211,769	59,868	69,936	24,033	26,030	63,906	455,542

Table 2.4: The distribution of disabled persons in Gauteng (Adapted from www.ilo.rog).

The above mentioned prevalence emphasizes that learners with visual impairments need to be supported in the best possible ways to ensure that they attain their optimal potential.

To be able to know the needs of learners with visual impairments it is necessary to expand on the characteristics of these learners next.

2.9 CHARACTERISTICS OF LEARNERS WITH VISUAL IMPAIRMENTS

The level to which a visual impairment can affect a learner's development depends on the type of visual loss, severity, age of commencement, intellectual ability, and environmental experiences (Jamieson, 2004:170). The lack of vision or reduced vision may result in delays or limitations in motor (mobility) skills, cognitive (thinking), and social development. Jamieson (2004:170) affirms that children who are congenitally blind exhibit the following characteristics:

- Motor skills: without visual input, a preschooler may not be motivated to walk towards interesting objects in the environment, because he does not see the object. Therefore, his motor skills develop at a slower rate than those of sighted children. However, as soon as the preschooler with a visual impairment finds it exciting to hear sounds, he or she will begin to reach and move toward the objects in the environment that make the sound. Visual impairments often lead to delays and deficits in motor development (Jamieson, 2004:170);

- Cognitively: the child who has a visual impairment finds it difficult to be familiar with objects in the environment outside his grasp, including those that are too large or too small or are moving (Jamieson, 2004: 170). This means that blind learners have limited concrete experiences. While the use of other senses enables the child to obtain information about the environment, a cognitive limitation does exist in the range and variety of experiences. Impaired or absent vision makes it difficult to see the connections between experiences (Jamieson, 2004:170). They may have difficulty with abstract language such as expressing their feelings and emotions. Lack of vision often results in the child who is blind having an individual limited vocabulary (Jamieson, 2004:170);

- Socially: a child with a visual impairment is limited in interaction with the environment. The child cannot see the facial expressions of parents, teachers, and peers; the child cannot model social behaviors through imitation; and sometimes he is unaware of the presence of others unless a sound is made. While touch provides direct information, it is often socially unacceptable. The older child is limited in the ability to orient to environmental cues and travel freely, implying that a grown up child will have difficulties in acquainting himself with the environment around himself. This means that children with a visual impairment interact less and are often delayed in social skills. Many persons who have lost their sight report that the biggest difficulty socially is dealing with the negative attitudes and behavior of those around them (Jamieson, 2004:170);

The Sacred Heart College (2008:6) supplies a scholastic summary of characteristics that a learner might have if he has problems with visual acuity or with different types of visual processing. They:

- forget how letters look (can't identify letters);
- confuse letters with similar appearances (e.g. n for h);
- misread little words in text (e.g. were for where);
- transpose letters when reading or writing (e.g. on for no);

- reverse letters when writing (e.g. b for d);
- have trouble remembering basic sight words;
- have trouble copying from a book or chalkboard to paper;
- spell the same word in different ways;
- spell words according to how they sound rather than to how they look; and
- read at a slow rate.

If the learner with a visual impairment experiences the above mentioned problems the question can be asked how the curriculum can be adapted for them in an inclusive education setting.

2.10. CURRICULUM ADAPTATIONS FOR LEARNERS WITH VISUAL IMPAIRMENTS

Although the NCS (National Curriculum Statement) will be changing in the next few years some of the principles, which will be referred to in this paragraph, will still be applicable to a new curriculum in an inclusive education setting.

A broad and balanced curriculum for all learners, despite the barriers to learning that they might experience should be provided (DoE, 2002:8). For example, the use of ICTs across the curriculum will still be essential so that all learners with visual impairments should be given opportunities to apply and develop their ICT capability through the use of ICT tools to support their learning in all subjects (Becta, 2002:2) (c.f.chapter 3).

According to the NCS (2002) a curriculum should have several mechanisms that must be flexible enough to allow for adaptations for visually impaired learners. Examples of these flexible features include (DoE, 2002):

- Activities can be flexible;
- the context can be made relevant to the visual impaired learner's needs;

- more time can be provided for assessment and execution of a task for visually impaired;
- the learning programme can be structured to meet the needs of visual impaired learners ;
- visually impaired learners can communicate through the use of Braille, assistive devices or any other communication methods;
- visually impaired learners should be identified and understood so that learning and assessment can be adapted or modified appropriately; and
- a supportive environment must be created by changing the way that the school thinks and feels about visually impaired learners, adapting the way educators teach and promoting a flexible curriculum (DoE, 2002).
- Maghuvhe (2008:85) asserts that curriculum adaptations are varieties to teaching and learning or content of a curriculum. These could be modifications of the learning environment, teaching and learning techniques, teaching and learning support material that enhances performance of visually impaired learners or allows at least partial participation in a learning activity, learning programmes and assessment (Maghuvhe, 2008:85). The Sacred Heart College (2008:11) asserts that visually impaired learners are unique and as such need to be 'handled' differently. It is the educator who has to make sure that these learners achieve their full potential. According to the Sacred Heart College (2008:11), educators often give only one opportunity for learning and thinking and this is the norm against which the visually impaired are usually assessed. Instead, many learning opportunities should be provided. Any curriculum that is not visually impaired centered and paced accordingly excludes the visually impaired learner from learning and actively participating in the learning process (Fraser & Maguvhe, 2008:85).

2.10.1 What to consider when making curriculum adaptations

When making adaptations, careful planning, evaluation and monitoring must be done. Before adapting the curriculum for visually impaired learners, it is first

important to decide what the class activity entails, as slight adaptations may suffice, thereby eliminating unnecessary work for the educator (Bird, 2004:1).

Holbrook and Koenig (2000:173) affirm that there are factors that educators should remember when adapting instructions for a learner with a visual impairment. Educators should consider:

- The functional implications of the learner's visual impairment, such as photophobia (sensitivity to light) or tunnel vision(only central viewing);
- the learner's personal preferences. A learner may prefer to use vision rather than tactile sense to explore objects;
- the primary and secondary goals of the activity; and
- the learner's level of adaptive skills: his level of listening and comprehension skills and ability to use technology such as Braille, ICTs and the cane.

The Sacred Heart College (2008:11) asserts that educators also have to keep the following in mind about visually impaired learners when adapting the curriculum or assessment. Each visually impaired learner:

- is different;
- learns in a different way;
- has different interests, talents and strengths; and
- may experience the impairment (loss of vision) at different levels.

Adaptations may involve providing additional or different materials to use during teaching and learning. According to Wilkens (2004) most materials may be adapted in one of the following four ways:

- Firstly, the readability level is adjusted;
- secondly, the critical features of the content are enhanced;
- thirdly, materials are adapted to appeal to the sensory modalities other than visual and auditory; and
- lastly, ICTs can be used.

The following are curriculum adaptations that could be made for the teaching of blind and visually impaired learners (Fraser et al, 2008:85):

- Setting a substitute task of similar range and demand;
- replacing one impossible or unfriendly task with a task similar of a different kind;
- allowing the learner to undertake a task at a later date;
- using another planned task to assess more outcomes or aspects of outcomes than originally intended;
- giving the learner concessions (e.g. extra time) to complete a task;
- using technology, aides or other special arrangements to undertake assessments tasks;
- using an estimate based on other assessments or work completed by the learner (in circumstances where the above provisions are not feasible or reasonable);
- considering the format in which the task is presented, e.g. the complexity of graphs, diagrams, tables, illustrations, experiments, cartoons etc. (Fraser et al, 2008:85); and educators should reduce the amount of work to be covered by summarizing it or
- getting visually impaired learners to memorize fewer facts and allow learners to complete alternate questions or problems of the activity (Wilkens, 2004).

2.10.2 The Individual Support Plan (ISP)

An Individual Support Plan (ISP) is a written working document for each learner with a barrier to learning that is developed, reviewed and revised on an ongoing basis. The ISP includes personal and diagnostic profiles (Wilkens, 2004).

This also applies to visually impaired learners. It describes the current levels of achievement in each learning area/subject and lists the expectations or goals for the learner as developed by the educator, the parents and the learners themselves (Wilkens, 2004).

In an ISP, a detailed description of the particular adaptations to be made is given. It further includes learning, teaching and assessment strategies, support material and assistive devices, such as ICTs, required. The ISP needs to be updated regularly and notes, dates, results and recommendations should be kept for progress sake (Wilkens, 2004).

The primary goal of the ISP is to ensure that the visually impaired learner benefits from the same curriculum as their sighted peers. It is, however, important to determine on what level the visually impaired learner is functioning as this will facilitate the process of adapting the curriculum into an ISP for them. The ISP specifically refers to a plan for the individual learning needs of visually impaired who are identified as needing support over and above the differentiation in a typical multilevel class (Wilkens, 2004),

According to Wilkens (2004) the ISP should be developed by a team comprising of school staff, parents and learners where possible.

2.11 CONCLUSION

This chapter supplied a definition of inclusive education as it applies to visually impaired learners. The implications of inclusive education for visually impaired learners were also discussed. Proposals as stated in White Paper 6 on the inclusion of learners with barriers were debated and discussed in relation to what is currently happening in schools. Challenges facing the implementation of inclusive education for visually impaired learners were highlighted. Different types of visual impairments were discussed; the accommodation of visually impaired learners in inclusive education, the different teaching and learning strategies as well as how curriculum adaptations can be made were also deliberated on.

One tool that can enhance the learning possibilities for learners with visual impairments in an inclusive education setting is the use of ICTs. In the next chapter the use of ICTs for the visually impaired learners will be discussed.

CHAPTER 3
INFORMATION COMMUNICATION TECHNOLOGY AND INCLUSIVE EDUCATION

3.1 INTRODUCTION

In the previous chapter some background on what visual impairment entails was provided. The educational needs of learners with visual impairments within an inclusive education setting were also identified and discussed. Different types of Assistive Technology (ATs) tools are available to address these educational needs of learners with visual impairments. One of these resources that can be used to address the educational needs of learners with visual impairments is Information Communication Technology (ICTs).

For both visually impaired learners and their educators, ICTs represent access to new worlds. They provide information about new areas of learning, which is text, audio and graphic based (Ayres, 2005:241). They also stimulate new ways of thinking and analyzing of problems. With ICTs, visually impaired learners and their educators are free to “play” with the information and find facts and ideas in different ways (Lamy & Goodfellow, 1999:29).

Hegelheimer and Tower (2004:185) further acknowledge that ICTs add a new, exciting dimension to data gathering and use. It is almost as if personal computer software adds some personality routine facts. For visually impaired learners, this added zest can be the key to more productive and focused study sessions.

A discussion on the concept of ICTs followed by their use in teaching and learning, focusing on visual impaired learners will follow.

3.2 DEFINITION OF CONCEPTS

3.2.1 Assistive technologies

Brandjes (2002:10) states that Assistive Technologies (ATs) can be defined as devices or services: "*An Assistive Technology device is: "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities. The AT service directly assists an individual with a disability in the selection, acquisition, or use of an assistive technology device."*

In other words in the world of the visually impaired, ATs are devices, services, or learning and teaching tools that can be modified so that visually impaired learners are able to use them in the process of learning and educators can use them during teaching.

3.2.2 Information Communication Technology

For the purposes of this study, ICTs represent the convergence of information technology and communication technology through the use of AT's. ICTs are the combination of networks, hardware and software as well as of the means of communication, collaboration and engagement that enable the processing, management and exchange of data, information and knowledge (DoE, 2004:15).

3.2.2.1 Information Technology

Information Technology (IT) is a term used to describe the items of equipment (hardware) and computer programmes (software) that allow people to access, retrieve, store, organise, manipulate, and represent information by electronic means. Personal computers, scanners and digital cameras fit into the hardware category; database programmes and multimedia programmes fit into the software category (DoE, 2004:15).

3.2.2.2 Communication Technology

Communication Technology is a term used to describe telecommunication equipment through which information can be sought, sent and accessed, for example, phones, faxes, modems and computers (DoE, 2004:15).

3.3 EDUCATIONAL TECHNOLOGY

Educational Technology, also known as e-learning, instructional technology and learning technology refers to the use of technology to support the learning process. Although the term can refer to all kinds of analogue technologies, for example photographs, film, video, audio recordings etc, it is usually used to talk specifically about digital computer technology (DoE, 2004:15).

Although technology is widely used in the administration and management of education (e.g. student records, marketing, procurement, finance etc.) and in research, educational technology is only concerned with technology as it impacts upon the learning process, for example in delivering learning materials, facilitating communication and providing assessment and feedback (Kennewell & Beauchamp, 2007: 227; Bello, 2003:29). In this way, technology benefits both traditional (i.e. face-to face) as well as open and distance learning models. It can also make it easier to combine different educational models to provide a blended learning experience tailored to individual needs (Salmon, 2000:14). This means that through the use of technology, an educator and a learner can still communicate live as well as at a distance.

3.3.1 E- Learning

In the South African context, the concept e-learning revolves around the use of ICTs in the achievement of national education goals such as inclusive education. E-learning is thus about connecting all learners, including those who are visually impaired and educators to each other and to provide professional support services as well as providing platforms for learning. E-learning can connect visually impaired learners and their educators. They both can access massive information sources from the net as well as share ideas via an effective combination of pedagogy and technology in support of

educational reform. The Department of Education (2004:15) affirms that e-learning supports larger systematic pedagogical, curricular and assessment reforms that will facilitate improved use of educational resources such as ICTs.

According to Freire, Linhalis, Bianchini, Fortes and Pimentel (2010:866) the challenge in this regard is to improve the simple exchange of information and to transform e-learning into a range of learning activities that meet educational objectives. E-learning is, therefore, more than just developing computer literacy and the skills necessary to operate various types of information and communication technologies. The Department of Education (2004:15) declares that e-learning is the ability to:

- Apply ICT skills to access (get information), analyse (examine the nature of information gathered), evaluate (estimate the value of the information), integrate (combine information), present (show or describe something in a particular point of view) and communicate information (pass information to other people);
- create knowledge and new technology by adapting, applying, designing, inventing and authoring information; and
- function in a knowledge society by using appropriate technology and mastering communication and collaboration.

The above abilities are also applicable to visually impaired learners and their educators since they too can apply ICT skills to access, analyse, evaluate, integrate, present and communicate information during teaching and learning.

3. 4 THE USE OF INFORMATION COMMUNICATION TECHNOLOGY IN SOUTH AFRICAN SCHOOLS

The use of technology to address developmental concerns, such as improving literacy levels, has increased throughout the world (Matodzi, Herselman & Hay, 2008:69).This rapid development of ICTs also impacted on the education sector in South Africa and the focus shifted to the increasing use of ICTs to address teaching, learning and administrative needs (Archer, 2003; Engelbrecht, Oswald & Eloff, 2003), even for visually impaired learners. This is

also seen through the introduction of an e-learning policy by the Department of Education (2004) which concentrates on the use of e-learning through ICTs.

There are two crucial factors that have inspired much interest in the use of ICTs as Assistive Technologies (ATs) for both individualized learning and also of the integration of learners with visual impairments into the mainstream schooling environment. One of these factors is the current emphasis and move towards inclusive education (DoE, 2001), whilst the other is the emphasis on the 21st century as an 'ICT century' wherein developments brought by ICT are changing people's lives (Matodzi *et al*, 2008:69), including the lives of the visually impaired. ICTs, in particular computers, have an unavoidable impact as learning and teaching tools, in the integration of visually impaired learners into the mainstream education system.

Conradie, Morris and Jacobs, (2003:199) assert that South Africa is still a developing country, because few people have access to technological infrastructure and computer skills, hence it will still be difficult to compile an ICT profile for all South African schools. Some South African schools can access ICTs, but at a low percentage, seeing that provinces are at different levels of ICT integration in education as indicated in Table 3.1 below:

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

Table 3.1 School with computers by province (2002) (DoE, 2004:12)

Despite some extreme variations, schools in Gauteng, the Northern Cape and the Western Cape have, on average, better ICT infrastructure than schools in the Eastern Cape and Limpopo. Schools in the Free State, KwaZulu-Natal, Mpumalanga and North West hold a middle position.

3.4.1 Information Communication Technology

The use of ICTs in mainstream schools began in the 1970s, but it has only been in recent years that the South African government, through the development of inclusive education, has recognized the importance of ICTs for learners experiencing barriers and consequently paid more attention to the use of ICTs as ATs for special educational needs (Stevens, 2004:22). One fundamental change that was brought in during the reorganization of schools for creating an inclusive culture was the introduction, integration and use of ICTs (DoE, 2004:8).

3.4.2 Computer Technology Integration

Beld (2004:43) defines computer technology integration as the provision of directed instruction or management of instruction to a learner, including the visually impaired learner. It therefore means that computer technology integration is one possibility in the selection of teaching and learning media, and the delivery mode is part of the teaching and learning design process. At the same time the integration of technology in an inclusive environment does not just mean adding computer hardware to classrooms. Carr, Reznick and Brown (1999:430) assert that ICTs must not merely be add-on activities in the classroom, but should add value to the teaching and learning process. Williams and Coles (2003:64) confirm that computer technology must:

- Be educationally sound;
- go beyond information retrieval to problem solving;
- allow new teaching and learning experiences;
- promote deep processing of ideas;
- increase learner interaction with learning areas;

- ❖ promote school and learner enthusiasm for teaching and learning;
- ❖ free up time for quality classroom interaction; and improve the teaching and learning process for learners with visual impairments.

In order to achieve the above ideals for the visually impaired, ICTs must have certain characteristics (Freire *et al*, 2010:867). Table 3.1 below indicates these important characteristics:

Characteristic	Definition
effectiveness	The device should improve the visually impaired learner's learning and living situation and improve functionality capability and independence
affordability	Visually impaired learners should be able to purchase, maintain, and repair a device without financial help
reliability	A device should be reliable, consistent, and predictable in its performance and levels of accuracy for reasonable amount of time
portability	The size of the device, weight on the visually impaired learner should be in such a way that it is movable, can be carried, relocated, and operated it in varied locations
durability	The device should be able to be used for a long period without wear and tear.
securability	It should be easy to secure the device from theft and vandalism.
safety	The devise should protect a blind learner, it should be a care provider, protect family member from potential harm, bodily injury, or infection.
learn ability	The device should be easily assembled by the blind learner, and it should take little time for the blind learner to know to use it.
comfort and	The blind learner should feel physically comfortable in using

acceptance	the device, he / she should not experience pain, or discomfort, how aesthetically appealing the user finds the device and the user's psychological comfort when using it in private or public is vital.
operability	The device should easily be used, adaptable and flexible; it should afford easy access to controls and displays.

Table 3.2.Characteristics of ICTs (Freire *et al*, 2010:867)

Salmon (2000:12) argues that an assistive device that can make the biggest difference to visually impaired learners is not the hardware, but the appropriate use of ICTs in the process of effective teaching and learning. This will be done only if educators are able to evaluate an assistive device.

From the above discussion it is apparent that integrating computer technology is not about the technology devices per se, but it is primarily about how it is implemented in effective teaching and learning processes and practices. Integration is defined not by the amount or type of technology used, but by how and why it is used (Kennewell *et al*, 2007:227).

3.5 THE IMPLICATIONS OF THE USE OF ICTS FOR EDUCATORS

3.5.1 Training of educators

The training of educators or mediators in AT is essential (Freire *et al*, 2010:868), because they are the main supportive pillars for visually impaired learners (Quist & Ntim, 2004:100). Smith and Kelly (2007:429) as well as Annable, Goggin and Stienstra (2007) declare that educators who are teaching visually impaired learners do not have the required knowledge and are also not suitably qualified (Motshwane, 2007:53) and trained in using ICTs. In a study conducted by Mack, Koening and Ashcroft (1990) on computer training of students with visual impairments it was concluded that teacher education programs (for learners with visual impairments) have an obligation to equip educators with the necessary knowledge, skills and motivation to provide the

much needed bridge between learners and technology. Consequently, Candela (2003) also had similar findings in his study, namely, that educators in schools for the visually impaired are unable to use ATs and that when it comes to blind learners these educators don't have the required know- how of using specific ATs.

For educators to successfully teach learners with visual impairments particularly in an inclusive environment, it is vital that they be trained on a variety of ATs beforehand and on a continuous basis so that they are able to use ATs and understand the challenges involved in teaching visually impaired learners (Quist *et al*, 2004:100). In the modern and fast developing technological world this will include ICTs.

Quist *et al*. (2004:100) confirm that for educators to be able to implement the supportive nature of ICTs, they should first understand the uniqueness and learning needs of visually impaired learners. They must be able to plan and carry out daily activities that would help their visually impaired learners gain as much information as possible through the non-visual senses like ears and by participating in active and practical exercises. This includes having special competencies and skills in ICT to meet the needs of visually impaired learners. In the process, the Department of Education has to provide infrastructure for ICT systems, supply ICTs and ultimately install them to make sure that a visually impaired learner's education and learning is optimised (Bryant, 1998: 54). Thereafter, teachers and learners need to be fully trained to use these ICTs in an appropriate manner.

Selinger (2008) declares that educators are sources of knowledge and that children are empty vessels waiting to be filled with the knowledge and wisdom. However, this statement is hard to defend in the information age. The amount of knowledge available, its breadth and depth, are far beyond the field of most educators, as is their control of learners' access to it. The teacher's role within an ICT-rich environment must necessarily change to help learners with visual impairments learn in the best way possible by recognizing the different needs of these learners and by supporting them into making choices about how and

where they access new knowledge. To ensure that educators use technology in appropriate ways for visually impaired learners for knowledge access, different ICTs can be used in classrooms. ICTs' roles need to be considered together with how the teacher integrates teaching strategies that support each role within the curriculum (Selinger, 2008:2). The Integration of ICTs within the curriculum is therefore vital. The following are principles of incorporation when using ICTs during teaching and learning of learners with visual impairment in an inclusive environment. In this context Integration means:

- Teaching a learner with a visual impairment in totality. This means overcoming artificial separations and the combination of all essential elements in the teaching and learning process (Jakovljevic, 2002:31), as well as exploring other senses of the learner that can be pursuit for learning;
- teaching and learning through the use of ICTs. It means changing and improving the quality of tuition for visually impaired learners (Crabtree, Nathan & Reeves, 2002:19). Instructional technology could be the channel for including visually impaired learners in the mainstream classroom. Many times when schools try new means of improving the quality of education offered in mainstream schools, the use of technological tools is often neglected. This may also be true for special schools catering for the visually impaired (Maddux, Cummings & Torres-Rivera, 1999:43); and
- taking into consideration that ICTs are valuable resources, but only when used properly will they enhance human competence, otherwise if improper ICTs are procured, schools and learners may not benefit (Norris, Smolka & Soloway, 2000:45).

The Department of Education (2004:17) declares that the invention of ICTs created access to better learning opportunities, redressing of inequalities, improvement in the quality of learning and teaching, and deliverance of lifelong learning. ICTs have the ability to accommodate differences in learning styles and eradicate barriers to learning like visual impairments. This is possible when provision of expanded opportunities and individualized learning

experiences are catered for. Consequently, ICTs can be the vehicle for inclusive education for the visually impaired learner (DoE, 2004:17).

The following actions for educator training are identified by Kennewell *et al* (2007:231) as those that can support the use of ICTs in education for the visually impaired:

- Speed: the use of ICTs can make processes happen faster than other methods;
- automation: ICTs should make formerly tiresome or effortful processes happen automatically (other than changing the form of representation);
- capacity: the storage and retrieval of large amounts of material should be possible through ICTs;
- range: access to materials in different forms and from a wider range of sources than otherwise possible;
- provisionality: the facility to change content; and
- interactivity: the ability to respond to user input repeatedly (Kennewell *et al* 2007:231).

3.5.2. Benefits of ICTs for education

As could have been deduced already from the above discussions, it is obvious that ICTs must have several benefits for education, specifically for a learner with a visual impairment. Woodall (2004) states that ICTs through e-learning programmes, present new solutions and deliver lifelong learning. Although, some problems appear undefeatable when teaching visually impaired learners nowadays, visually impaired learners are among the major beneficiaries of the technological revolution (Woodall, 2004:1).

Matodzi *et al*, (2008:71) affirms that ICTs can redesign learning around the needs of visually impaired learners. It can provide content matched to what the visual impaired learner needs to learn at a specific point in time, in a style that matches the way the visually impaired learner prefers to learn, in a quantity matched to the time the visually impaired learner has available, in a time that is

convenient for the learner, and where the learner happens to be (Matodzi *et al*, 2008:71). Therefore, ICTs through e-learning programmes can:

- ❖ present new solutions and deliver lifelong learning e.g. instead of reading text materials, learners with visual impairments can listen to text through audio materials like CDs and DVDs (Woodall, 2004:1);
- ❖ allow flexibility during teaching and learning hence embracing the needs of visually impaired learners (Matodzi *et al*, 2008:71);
- ❖ encourage learner-centered learning;
- ❖ encourage active, exploratory, inquiry based learning; and
- ❖ encourage collaborative work among learners and educators (DoE, 2004:19).

Other benefits can also be:

- ❖ Educators can teach visually impaired learners through individualized computer-based learning programmes;
- ❖ visually impaired learners are involved in their own learning and can consequently improve their investigative learning skills;
- ❖ other skills like word-processing programmes are developed for visually impaired learners, which will e.g. allow them to do their projects using computer programmes;
- ❖ communication among all learners as well as the visually impaired learners is enhanced (Florian, 2004:7); and
- ❖ ICTs can be used as a management tool, e.g., through Individualized Support Plans (ISP's) (Wilkens, 2004).

Selinger (2008:1) highlights that the South African Government, in particular, often says that there is lack of research-based evidence to support the positive effects of ICTs. However, a recent review and a critique of more than 100 research studies by Mumtaz (2000) on evidence of learning through ICTs found proof that ICTs:

- ❖ enable learners to find different ways into the curriculum, and raises

- ❖ the status of visual literacy acquisition through text;
- ❖ allow independent learning at an individual pace;
- ❖ provide motivation and create variety in teaching and learning methods; and
- ❖ generate enthusiasm, interest and involvement. ICTs maintain attention and enjoyment and support the development of new ways to present difficult ideas e.g. a blind learner can listen to a novel through a DVD / CD instead of reading it.

In the context of this research, it was highlighted that ICTs refer to convergence or infusion of information technology and communication technology through the use of ATs in the learning and teaching of visually impaired learners. Eurydice (2004:34) affirms that in such a setting, the visually impaired learner has, for example, access to the vast network of information on the internet. As a result of this connection to the internet, visually impaired learners are always connected to an exciting new world of hot and lively current information (Eurydice, 2004:34).

Some studies have been conducted in the past to survey the use of ICTs and how ICTs influence children's learning and communication development, especially when they are visually impaired. Most of these studies are still applicable today. It was found that:

- ❖ Interactive Classroom Television Systems (ICTS) improve continuous communication among educators, peer groups and visually impaired learners. It was also found that partially sighted learners can read printed matter, look at pictures, write with a pen or pencil and even do workbook problems through ICTs (Bikson, Bikson & Genensky, 1979);
- ❖ Carey (2000) and Rovenscraft (2000) found that ICTs can enhance access to library-based services for visually impaired learners;
- ❖ Tzovaras, Nikolakis, Fergadis, Malasiotis and Stravakis (2002) state that ICTs improve the development and test of a virtual reality training system that combines haptic and sound information in an innovative

way for visually impaired learners, especially those who are blind from birth;

- accessibility to transcoding systems to make web pages accessible for the blind is made possible through ICTs. This system can transcode complete pages on annotated sites into accessible pages without changing the original pages (Takagi, Asakawa, Fukuda, and Maeda, 2002);
- Asakawa, Takagi, Ino and Ifukube (2002) describes auditory and tactile interfaces to represent visual effects non-visually for blind users, allowing intuitive recognition of visual content that appears on the web. The results of the research showed that the auditory interface was more useful for instinctive recognition, while the tactile interface was useful for information requiring concentration;
- Letcher (2008) concluded that well-planned physical activities that use suitable ICTs maximize visually impaired learners' abilities and minimize challenges they may face; and
- Interactive Whiteboards (IWBs) promote synchronous interaction between learners, teachers and people involved in the learning process (Mahon, 2008).

3.5.3. Challenges of ICTs

The implementation of ICT use in tuition also poses challenges for teaching and learning both globally and in South Africa (John & Sutherland, 2004:101; Hodgkinson- Williams, 2005). The White Paper on e–Education (DoE, 2004:8), categorizes ICTs' challenges into three main areas, namely participation, access, cost effectiveness and quality of ICTs used in tuition.

Conradie, Morries and Jacobs (2003:200) discuss the three main areas of challenges, which can also be applicable to learners with visual impairments as follows:

- **Participation**

For the full participation of visually impaired learners, it is necessary to first determine which ICTs are relevant for each visually impaired learner and according to their different levels of acuity. This is important because learners' levels of acuity vary. In a study by Freire *et al* (2010) it was found that in the use of IWBs, visually impaired learners complained that little information and explanations are provided about what was drawn on the board (IWB) especially in Maths, Geography and Biology. This minimise the participation levels of these learners.

- **Impact and quality**

Ongoing training is essential for educators on how to use relevant ICTs because new software is continually produced by different companies. Educators who are continually receiving full training on the use of IWBs stated that all learners, including the visually impaired are able to access learning content (Freire *et al* 2010:874).

- **The community benefit versus individual benefit:**

Many communities, especially those in the rural areas, don't cater for or have ICTs to accommodate visually impaired learners e.g. in public libraries.

- **Costs to buy and install ICTs are high.**

Specialized people are needed to install ICTs in schools for the visually impaired, therefore, it might be expensive to procure, install and maintain ICTs for the visually impaired, especially in rural schools and in some urban schools. ICT is a new technology to South African township schools (Mercadante, 2002:56). Focusing exclusively upon the newness of computer technology alone, independent of teaching and learning processes, may create a situation where irrelevant AT's that are expensive and difficult to maintain are available in schools and then become white elephants later.

3. 6 THE VISION OF INTEGRATING ICTS INTO THE TEACHING AND LEARNING OF THE VISUALLY IMPAIRED LEARNER IN SOUTH AFRICA

ICTs are resources that should be viewed as tools for re-organizing schooling as well as an educational tool for whole school development (DoE, 2004:19). The Department of Education's aim is, through e-learning, to connect learners and educators to each other as well as to professional support services; providing platforms for learning; and to ensure that every South African learner is ICT capable by 2013. The success of the infusion of ICTs into teaching and learning settings should ensure that every learner is equipped for full participation in the knowledge society. The following are some of the government-driven programmes which are in line with the implementation plan of the White Paper on e-Education in South Africa:

- KHANYA Project: The Khanya project is an initiative of the Western Cape Department of Education, which started in April 2001. The project looks at ways to use information, communication and audiovisual technology to improve teaching and learning in schools (htt~:llwww.khanya.co.za);
- Gauteng Online: The initiative for implementing lCTs in Gauteng schools falls under the umbrella of Gauteng Online (GoL) driven by the Gauteng Department of Education (http://www.gautengonline.com); and
- The National Portal initiative (http://www.thutong.org.za): Thutong is the Department of Education portal for all educators and learners, specifically aimed at those in grades R to 12. It has been created to support quality of teaching and learning in South Africa. The portal is part of government's intention, White Paper on e-Education, to turn South African schools into centers of quality learning and teaching for the 21st century.

The above initiatives suggest that visually impaired learners can benefit from these projects if all of them can be extended to all schools, including special/specialised schools.

The White Paper on e-Education (DoE, 2004:22) highlights some key elements and strategic objectives of the e-education policy framework. These key elements are given below as follows:

- **Equity**

The White Paper on e-Education (DoE, 2004:22) addresses the equity principle in Chapter 4 and is of the view that there needs to be an equitable allocation of resources and that all schools, including school who cater for learners who experience barriers to learning, should be prioritised to ensure that technology use in the education sector does not further exacerbate the digital divide within South Africa.

- **Access to ICT infrastructure**

The impact and effectiveness of ICTs rest on the extent to which end-users (learners and teachers) have access to hardware, software and connectivity. For e-learning to be successful, learners must have regular access to a reliable infrastructure (DoE, 2004:22).

- **Capacity**

In the context of e-education, this element includes educator training, technical support and related high-level ICT skills capacities, as well as teaching methods that embrace e-literacy and skills development (DoE, 2004:22).

- **Socio-cultural factors**.

The Department of Education (2004:22) lauds the applicability of e-education within the South African context, whereby it can be adopted by learners who represent a wide array of cultures, languages and social backgrounds.

- **Political will**

Chapter 7 of the White paper on e-Education (DoE, 2004) asserts that the Department of Education will invest in national initiatives to increase access, boost the capacity of managers, educators and learners, and provide electronic resources of the highest quality.

- **Funding and resourcing**.

The Department of Education has a realistic appreciation of the fiscal constraints affecting the Government, the vast upfront investment required for e-education and the need for on-going and predictable funding sources for the longer term, and has identified a comprehensive source of funding, including license revenues, private sector donations and partnerships (DoE, 2004:34).

In chapter 5 of the White paper on e-Education the Department of Education, (2004:25) has considered many of the factors necessary to ensure that its ambitious e-education goal is attained, and has captured them within the five strategic objectives namely:

- **ICT professional development for management, teaching and learning**

Every teacher must acquire knowledge, skills and support to integrate ICTs in teaching and learning of all learners, including visually impaired learners.

- **Access to ICT infrastructure**

Through appropriate technology, it is hoped that South Africa will leap-frog into the new century, by-passing the unnecessary adoption cycle, and implement a solution that currently works, and has the capacity to handle further developments. It is envisioned that every teacher and learner in the General as well as the Further Education and Training phases must have access to ICT infrastructure.

- **Connectivity**

Every teacher and learner in the General as well as the Further Education and Training phases must have access to an educational network and Internet.

- **Community engagement**

The White Paper refers to, for example, the local economic environment engaging with Small Micro-Medium Enterprises (SMME's), in the context of providing technology repair services (DoE, 2004:32). The White Paper also recommends that the community can utilise e-schools' facilities after hours.

Services provided by SMME's should be extended to all schools. These services should be assessed and evaluated to ensure that the services that will be offered to e-schools are relevant and useful. Schools must work in partnership with all stakeholders to ensure shared knowledge about ICTs and extended opportunities for learning and development through ICTs (DoE, 2004:32).

- **Research and development**

The community, through research and development must continuously assess current practices, explore and experiment with new technologies, methodologies and techniques that are reliable and will support teachers in e-learning. In the section on "co-ordination and collaboration", the Department of Education mentions the establishment of a Ministerial e-Education Advisory Council consisting of ICT experts from the public sector, academia, and private and civil society to supervise all the implementation processes (DoE, 2004:32). This was a shift in the right direction in that such a body should serve to streamline the process developments.

The implementation of the above meant that visually impaired learners can also benefit from locally based mainstream schools and even from any special/specialised school. If SMMEs give more funding to e-schools, it means

more community involvement, giving birth to proper control and better services to all stakeholders.

In the following section the different Assistive Technology, specifically ICT devices that are available will be discussed.

3.7 ASSISTIVE TECHNOLOGY DEVICES

Assistive Technologies (ATs) can be defined as devices or services (c.f. 3.2). The following are ICT devices used as assistive technology:

3.7.1 Braille systems

Braille is a system of raised dots used by visually impaired persons as a literacy tool to be able to read and write (Bishop, 2004:322). In other words, visually impaired learners can read the dots through 'touching' using fingers. Braille translation software that produces a text version of the learner's work for educators to read do exist. It can be beneficial for some learners to print text out in Braille or soft Braille using an embosser. A Braille embosser is a printer that provides text Braille (Farnsworth & Luckner, 2008:171). Written text can be converted to Braille using a scanner and a Braille printer. In addition, Braille keyboard computers are available with synthesized speech or moving Braille output.

3.7.2 Voice Synthesisers

Voice synthesisers involve the use of computer software and a sound card to read to the visually impaired user what they are typing or what is on screen (Australian National Training Authority (ANTA), 2003:11). Speech synthesizers convert electronic text to speech. This means that visually impaired learners can use voice synthesisers to convert what they are typing or what is displayed on the screen of the computer to be audible. The
most commonly used voice synthesiser is called Jaws Access With Speech (JAWS TM) (ANTA, 2003:11). JAWS TM allows access to the computer for

learners who are visually impaired by speaking aloud what is written on the displayed screen of the computer.

3.7.3 Optical Character Recognition systems

The Australian National Training Authority (ANTA) (2003:11) describes Optical Character Recognition (OCR) systems as a process by which printed text in books, magazines or newspapers is transformed directly to speech or digitised information using a scanner. When a speech synthesiser is used with an OCR system, learners with visually impairments gain immediate access to printed material through hearing (Farnsworth *et al*, 2008:171).

3.7.4 Closed Circuit Television systems

Closed Circuit TV Systems (CCTV) allow the visually impaired learner to:

- Get bigger text (magnified text) in the form of documents, books, into a computer or TV screen;
- switch between CCTV picture and word processing software;
- have a fixed camera over a movable table on which the document is placed or a movable camera which can be rolled over the document;
- work with computer programs and view the enlarged CCTV image on the same screen; and
- enlarge text in libraries, shops or the workplace (ANTA, 2003:12)

3.7.5 Text enlargement software

ANTA (2003:12) states that a wide range of computer software exists which will enlarge a picture on a computer screen which will mostly benefit partially impaired learners. The following are some of the text enlargement software:

- MS Windows environment is ZTWin TM or Zoom Text TM for Windows which allows the user to vary magnification, colours, specific parts of the screen, scroll and set ‘target’ areas of the document; and

- CloseView TM and Inlarge TM are examples of two programs used in a Macintosh environment (ANTA, 2003:12).

3.7.6 Interactive Whiteboard

Interactive Whiteboards (IWBs) is an intervention tool that provides synchronous interaction between visually impaired learners, educators, an intermediary and other people involved in the learning process (Freire *et al*, 2010:866). Through its software, it can portray what is called 'pen-based electronic ink explanation'. Explanations of teachers can be recorded and reviewed and listened to by visually impaired learners at a later stage.

3.8 ACCESSIBILITY TO THE INTERNET FOR LEARNERS WITH VISUAL IMPAIRMENTS

According to Alexander (2001:240) schools have been faced with numerous changes in their external and internal environments since the 1990s. They are forced to respond to emerging challenges such as the continual developments in ICT; a shift in learner expectations; changing demographics of learners; the speedy development of subject knowledge and decreasing financial support (Alexander, 2001:240).

One challenge faced by schools is the use of the internet, which has fast become an everyday tool for information and entertainment. Using the internet for teaching and learning as an educational tool, offers a global open platform for information storage and display which can be textually, graphically and audio, visually, and audio-visually accessed (Keegan, 2000:90). This means that visually impaired learners can access information that is supplied by the internet through audio means in text (i.e. converting normal text to Braille).

However, the issue of 'accessibility' of the internet is important to investigate, since the accessibility to the internet has become a moral and legal issue (Konczal, 1999:1).Schools and libraries often do not cater for internet access to visually impaired learners, the reason being that visually impaired learners were classified as a group that had architectural barriers which hampered them

to access text materials because they could not see (DoE, 2004:22). If architectural barriers are removed, everybody will be participating in the information society. Consequently, the following statement by Thabo Mbeki, the former president of South Africa, will then be realised: "*every South African learner, will be ICT capable (that is, use ICTs confidently and creatively) to help develop skills and knowledge They need to achieve personal goals and to be full participants in the global community) by 2013*" (DoE, 2004:38).

It is known that internet use is mainly through visual means (Flowers, Bray & Allozzine, 1999:23), which could imply that learners with visual impairments are unable to access it. However, a number of ATs, like Optical Character Recognition, were developed to facilitate the use of the internet specifically for learners with visual impairments. Flowers *et al.* (1999:23) state that technological developments have improved accessibility and provided new and exciting opportunities for the use of the internet by visually impaired learners. These developments have advantages and disadvantages in the process of accessibility for learners with visual impairments.

In the section below, the researcher provides some advantages (developments) and disadvantages (complications) of internet use as an educational tool for learners with visual impairments.

3. 8.1 Advantages of the internet for learners with visual impairments

According to Garrison and Anderson (2003:115) interaction in all its forms (among learners, learners and educators, learners and information or content) is an essential element in the learning process. ICT through e-learning has the capacity to support interaction as *"the true uniqueness of e-learning lies in its multidimensional forms of communication and interaction (i.e., simultaneous familiarity and distance; multire presentational; hyper searchable) that are truly multiplicative".* Through the internet visually impaired learners are able to interact among themselves, peer groups, educators

and information content. This means visually impaired learners will be able to control and directly influence their tuition through communication that occurs through electronic mails (e-mails) (Garrison & Anderson 2003:115).

Arrigo (2005:3) declares that the internet provides learners with visual impairments access to high volumes of information for their projects and curriculum needs like all other learners. This information can be searched at every learner's pace, place and can be retrieved and disseminated in different formats depending on the project in hand. Therefore, it is important that all learners with visual impairments receive the maximum benefit from internet use and access and be included in activities that use this type of technology (Arrigo, 2005:3).

3. 8.2 Disadvantages of the internet for learners with visual impairments

Several barriers and difficulties involving access to the internet exist for learners with visual impairments. The most common are:

- Compound notations, science and maths notations (equations) are extremely difficult to render in an acceptable format when they are in a graphical form (Latyr, 2001:2), meaning that OCR can find it difficult to convert compound notations to sound;
- the conversion of information from the internet to Braille is time-consuming and may not be the most effective means of giving feedback to visually impaired learners on their academic performance, because those who underperform may not feel comfortable when their results are discussed through sound where everybody can hear (Farnsworth *et al* 2008:171);
- images and image maps are likely to become a barrier when an additional text description is not provided (Flowers *et al*. 1999:24). In in some subjects like life science images are needed to explain a concept e.g. food digestion;
- screen readers are a navigational challenge for visually impaired learners as their user agents cannot follow multiple events in multiple frames; and

- most information services provided by governments, public places are not fully ICT compliant. Visually impaired learners have to buy special adaptive devices such as OCRs to make the computer accessible (Arrigo, 2005:3).

The above deliberation provided evidence that a variety of usable ICTs are available for the learner who is visually impaired. The Department of Education envisions that every learner has access to different ICT devices and services. However the implementation and availability is still a challenge.

3.9 CONCLUSION

Schools can no longer ignore the use of ICTs when teaching visually impaired learners within an inclusive environment. The use of ICTs and the internet have become an integral
part of our education in South Africa. How effectively these educational tools will be used to enhance the learning process of visually impaired learners depends almost entirely on the building of good ICT infrastructure and on the development of proper strategies for visually impaired learners that not only optimize the use of technology to create convenience for visually impaired learners, but also address important pedagogical issues in the information age like how, when and which ICTs can be used by both teachers and learners.

The mentioned available ICTs are important issues that have to be evaluated and incorporated in a strategic ICT plan. School managers have to know the needs of visually impaired learners' and their educators before implementing ICTs. The South African government has to design and deliver quality ATs through accessibility and create communities of visually impaired learners who will be researchers. ICTs use should maximize technology to enhance the teaching and learning process of visually impaired learners.

We need to know the information society's potential on how to support visually impaired learners, and in particular tackle the removal of technical and other barriers to visually impaired learners effective participation in the knowledge

based economy and society. This chapter has also indicated which ICTs and ATs is suitable for visually impaired learners.

In the next chapter the research design will be elaborated on.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

In the previous chapters relevant literature with regards to the focus of this study was discussed. In this chapter the research questions, aims and research design will be elaborated on.

4.2 RESEARCH METHOD

Leedy and Ormrod (2005:105) highlight two types of research methods, namely, the qualitative and quantitative method. The difference between the two methods will be discussed below. Since this research used the qualitative method further characteristics of this method will be discussed in more details.

Quantitative research is "*a type of educational research in which the researcher decides what to study what to study, asks specific questions, collects numbered data from participants, analyses these numbers using statistics and conducts the inquiry in an unbiased, objective manner*" (Creswell, 2005:39).

Qualitative research is "*a type of educational research in which the researcher relies on the views of participants, asks broad, general questions, collects data consisting mainly of words (or text) from participants, describes and analyses these words for themes, and conducts the inquiry in a subjective, biased manner."* (Creswell, 2005:39). Henning, Van Rensburg and Smit (2004:5) state that qualitative research denotes the type of inquiry in which the qualities, the characteristics or the properties of a phenomenon are examined for better understanding and explanation.

Quite a number of research methods exist in literature which researchers can use for a specific nature and kind of research to be undertaken (DeMarrais &

Lapan, 2004:29). It is difficult to find one single research method that is suitable for carrying out every type of research problem at all times, therefore certain conditions and factors that involve the choice of research methods for any given research problem such as cost and time are considered when research is to be done (Denzil & Lincoln, 2005:35).

As such, it is necessary that a specific research problem be explained through relevant research methodology (Creswell, 2003:47). Given such factors and conditions, researchers have to consciously and firmly decide on and utilise only those research methods that would permit better, convenient and successful attainment of specific research aims (Maxwell, 2004:39). This study is not an exception and therefore the research method and techniques considered by the researcher to be relevant is a qualitative research method and was utilised as presented below.

Qualitative research studies include a number of different approaches (e.g. case studies; phenomenological studies; ethnographic studies and so on) aimed at understanding phenomena. According to Henning (2005:3) qualitative researches have typical characteristics:

- Qualitative research uses natural settings, it studies real-world situations as they unfold naturally; situations are not manipulated, unobstructed and not controlled; there is an openness to whatever emerges. This research avoids predetermined constraints on outcomes;
- the qualitative researcher acts as the human instrument of data collection;
- qualitative research reports use descriptive, incorporating expressive language. Importance is placed on understanding and paying attention to the words verbally used by participants (Bogdan & Biklen, 2007:37). The aim of paying attention to verbatim words is to determine common themes from responses as mentioned verbally by participants when similar questions are asked. The extent of qualitative research in education is less defined; it investigates the world of educators interviewed, researching their background and examining the

information gathered with the purpose of establishing the meaning of facts being provided (Bogdan *et al*, 2007:37);

- ❖ in qualitative research inductive data analysis is prevalent;
- ❖ qualitative research is interpretative in nature, aimed at discovering the meaning that events have for the individuals who experience them and the interpretations of those meanings by the researcher;
- ❖ qualitative research pays attention to the personal as well as the all-encompassing seeking of the uniqueness of each case;
- ❖ qualitative research has an evolving design, and researchers focus on the emerging process, as well as the outcomes or product of the research; and;
- ❖ qualitative research is judged using special criteria for trustworthiness (Henning, 2005:3).

Qualitative research has both advantages and disadvantages. A summary of the advantages and disadvantages is presented in Table 4.1 below (Smit, 2006).

Advantages of Qualitative Research	Disadvantages of Qualitative Research
Not limited to strictly defined variables; can be modified as the research progresses.	It is time consuming because of unlimited variables and possible modifications.
The researcher's role is that of an observer when collecting data. This allows the researcher to examine complex questions more closely, and discourages the researcher from becoming personally involved.	Information may lose its validity during its collection and interpretation.
Individuals (educators in this case) are given the opportunity to relate their understanding and experiences of the topic in hand. This means that personal data can be used.	Themes, motives and categories are not rigid and differ from one setting to the next, thus making it hard to compare research.

Not limited to a single final truth, but acknowledges that there may be multiple viewpoints	

Table 4.1: An overview of the advantages and disadvantages of qualitative research (Smit, 2006).

4.3 JUSTIFICATION FOR THE USE OF QUALITATIVE RESEARCH

The qualitative method was chosen as most relevant and suitable for examining how educators use Information Communication Technology (ICT) as well as their training needs regarding this issue in supporting learners with visual impairments in Schools for the Visually Impaired in the Gauteng province. According to Leedy *et al* (2005:139) one of the features of qualitative research is that it is interpretative and practical in character.

Three other main reasons account for this choice for this study: i) it is a multi-perspective approach to social interaction aimed at describing, making sense of, interpreting or reconstructing interactions in terms of these meanings the educators who participated in this research, attach to it; ii) it is a type of formative research that could offer specialised techniques for obtaining in-depth responses about the use of ICTs by educators in schools for the visually impaired, how they use ICTs, problems encountered in the use or availability of ICTs, educators and learners' needs and wants, as it is exploratory and interactive; and iii) qualitative research provides a rich texture and context through which to learn about educator's use of ICTs in schools for the visually impaired without losing the rich descriptions of their attitudes and feelings and the essence of their experiences.

In this study a phenomenological design was followed because the researcher wants to understand the personal and professional experiences of special school educators who are teaching visually impaired learners and what their subsequent support needs are. Very little information is currently available on the phenomenon in question (namely the use of ICTs in teaching visually

impaired learners in Special School), especially in South Africa. In this research, a phenomenological study was used to understand educators' perspectives, perceptions and their understanding of the use of ICTs in inclusive education as well as their training needs regarding this issue (Leedy *et al*, 2005:144).

4.4 PROBLEM STATEMENT AND RESEARCH QUESTIONS

The problem that was identified was whether educators who teach learners with visual impairments in schools for the visually impaired have the knowledge and skills to use ICT to enhance learning opportunities for these learners. The following research questions were asked:

- What are the educational needs of learners experiencing visual impairments within an inclusive education system?;
- Which ICTs are suitable for learners who experience visual impairments?
- How can both the learner and the educator in schools for the visually impaired use ICTs in the process of teaching and learning?;
- In what way can the use of ICTs enhance learning in learners' experiencing visual impairments to learning?;
- Are educators in schools for the visually impaired trained to use ICT for the visually impaired learners?; and
- What recommendations can be made regarding training for educators in Schools for the Visually Impaired learner in the use of ICT in teaching and learning?

4.5 OBJECTIVES OF THE STUDY

The main objective of this study was to determine if educators who teach learners with visual impairments in schools for the visually impaired have the knowledge and skills to use ICT to enhance the learning opportunities for learners with visual impairments. This main objective was operationalised in the following sub aims:

- To determine what are the educational needs of learners experiencing visual impairments within an inclusive education system;
- to establish which ICTs are available for learners who experience, visual impairments;
- to determine how can both the learner and the educator in schools for the visually impaired use ICTs in the process of teaching and learning;
- to investigate how the use of ICTs can enhance learning for learners who are visually impaired;
- to ascertain if educators in schools for the visually Impaired are trained to use ICT for the visually impaired learners; and
- to construct recommendations regarding training for educators in Schools for the Visually Impaired in the use of ICT in teaching and learning.

The reason why a qualitative research approach was chosen above a quantitative research approach is that this method enabled the researcher to investigate themes identified in depth and detail through the personal experiences of the participants.

4.6 DATA COLLECTION

This section discusses the way the participants were selected, how the data was gathered and how these were transcribed and thematised.

4.6.1 Sampling

Sampling is a process of selecting sources of data (Leedy *et al*, 2005:144). It is the identification of individuals or stakeholders who can help in establishing a concise conclusion about a large number of people. As mentioned before qualitative research studies are deliberately non-random (Leedy *et al*, 2005:145). Since it is purposeful, the researcher had the opportunity to choose participants who could yield the most information about the topic under investigation.

Consequently, participants were purposely selected. According to McMillan and Schumacher (2001:175) purposeful sampling is a process of selecting participants for a particular reason: these should be participants who are 'information rich' on the study in hand. Since the researcher worked in the Gauteng Province as a Learning Material Resource Departmental officer, the researcher had a notion of what is available and what is needed regarding ICTs at the two selected schools for the visually impaired in the Gauteng province, namely Sibonile School, as well as Prinshof School for the visually impaired. It was therefore deduced that teachers from these schools will be able to provide rich information regarding this topic (McMillan *et al*. 2001:175).

Although the population of all possible participants comprised of all educators teaching at schools for the visually impaired, due to potential logistical and practical problems, it was decided to focus this research and to limit it to educators teaching in schools for the visually impaired in the Pretoria and Vereeniging areas.

Permission was first requested from the Gauteng Department of Education by the researcher and approval was given (see attached Addendum D). Afterwards permission was requested from the District offices where the selected schools are located. With the permission of the principals meetings were held with all staff members wherein the researcher explained the purpose and gave details of this research. All the elements of the research such as the code of ethics, confidentiality, privacy, voluntarism etc. were emphasized in the meeting. Educators who participated from both schools were given a consent form to sign before interviews were carried out. The study was done using two schools for the visually impaired in the Gauteng Province: the first school is in an urban area (Pretoria) and the second school in a rural area (Meyerton).

4.6.1.1 School 1 (Prinshof School)

In this school, six educators who use ICTs were interviewed. From the six educators, only five agreed to be recorded and one educator said she will not participate if she is recorded. The researcher agreed to interview her without

recording her. The researcher took notes from this interview. Five of the educators mentioned above are females while the sixth is a male. All the five female educators are Heads of Department whilst the male educator is a psychologist who happens to also have teaching periods at this school.

After the interviews, the researcher was given a tour of the school and amazingly the school is well equipped with different ICTs used by visually impaired learners.

4.6.1.2 School 2 (Sibonile School)

The second school is in a semi-rural area. Seven educators were interviewed. From the seven educators, five were females and two were males. These two male educators are semi-blind.

The researcher was also given a tour around the school. It was found that the school has no ICTs, only a few old Braille machines and one Braille printer. These teachers mentioned that they were not trained on the use of ICTs, but they have knowledge of which ICTs can be procured for learners with different visual impairments. These educators mentioned that they usually see these ICTs when they attend meetings organised by the South Africa Society for the Blind. The Department of Education do supply them with some Learning Teaching Support Material (LTSM) such as prescribed literature, charts and a few toys, but according to them these LTSM's are quiet irrelevant for visually impaired learners. In both schools the researcher used individual interviews.

4.6.2. Research Instrument

This section discusses the instrument used to gather data from the participants who formed the sample of this research.

4.6.2.1. Interview procedure

An interview is defined as a face-to-face conversation used to gather information. A typical interview is more like an informal conversation, with the educators doing most of the talking and the researcher most of the listening (Leedy *et al*, 2005:184; Reber & Reber, 2001:367). The aim of the interviews was to obtain primary information from a sample of participants who were selected to participate in the study. In this study data was collected through semi-structured interviews.

Before the beginning of the interviews, the procedures of the interviews were explained to all the participants. These procedures specified that confidentiality would be preserved during the documentation and reporting process, the identity of the respondent would remain a secret throughout the research project and the respondents were asked to be called by pseudonym 'interview 1 or interview 2' etc. which was used for the recorded interview, the transcription and the reporting process in this dissertation. It was stated that the tapes with the recorded interviews and transcribed documents would only be available to the researcher and his study leader.

Before each interview, the respondents were asked if they objected to the researcher taking notes. They were also told that they would receive a copy of the *verbatim* transcript. Respondents were asked to read the transcript and make the necessary corrections. They were asked to correct it for any inaccuracies and to make sure that their statements accurately portrayed the information they provided and their experiences of using ICTs. The researcher requested the respondents to return their comments within one to two weeks after receiving their transcripts.

4.6.2.2 Semi-structured interviews

In a semi-structured interview the researcher asks a standard set of questions (Leedy *et al*, 2005:184). However, based on the responses of the participants the researcher felt it necessary to ask more individually probing questions to get clarification on certain issues.

The semi-structured questions are based on what the researcher wants to understand (i.e. the personal and professional knowledge, experience as well support and training needs of educators in using ICTs to teach visually impaired learners). A copy of the predetermined questions is supplied in Addendum A. Owing to the fact that this was a qualitative study, it was compulsory for the researcher to:

- Ask a number of open-ended questions;
- record word for word the answers given by educators;
- give educators chances to air their views; and
- produce an improved response rate by educators and by so doing enhance the quality of the study. These aspects concur with the advantages of interviews summarised by (Henning, 2005:74-76) below in table 4.2:

Advantages of interviews	Disadvantages of interviews
Interviews build relationships between the researcher and interviewees because personal contact is made and interviewees feel valued	Time and costs may be a constraint
Interviewees are requested to participate; hence they provide more and unintentional information about the phenomenon according to their own viewpoint and opinions. Interviewees may ask for clarifications where they seem confused.	Most students researchers are novices, therefore interviewers may not have good skills.
Interviewees are usually precise suppliers of information and can answer questions more directly.	Interviewees may be exhausted if in-depth interviews are done.
The researcher can probe interviewees so that there are no uncertainties or misinterpretations, meaning that an in-depth understanding of interviewees reasoning is supplied.	Probe interviewees can be time consuming

Table 4.2: Advantages and disadvantages of interviews (Henning, 2005:74-76)

4.6.3.3 The interview setting

De Vos (2006:280) states that human performance is, in many ways, predisposed by the environment or setting in which it occurs. Therefore, it is believed that researchers should, as far possible visit and preferably spend substantial time in their participants' normal territory wherein they can obtain first-hand data on how participants go about their everyday life. It is for this reason that participants in this research were encouraged to select an interview setting that would be private, suitable, and comfortable at their school.

Respondents agreed to be interviewed at their workplace and in selected offices. The choice of office and school as a setting was suitable for all as it provided them with privacy and comfort. Each interview took no more than one hour. This prevented participants from rambling on and instead helped to stay focused. More than enough information was gathered in the hour mentioned above to allow the researcher to make meaningful conclusions and recommendations. Participants were told that the interview would be audio-taped and asked if they had any objection to this purpose. All respondents, except one, agreed to be audio-taped. However, this one interviewee did not have any objections with the researcher taking notes during the interview.

4.6.4 Transcriptions and analysis

The interview data was recorded on audio-cassettes and as such the researcher had time to:

- Play back each tape in a chronological manner as the interviews were being conducted;
- listened to all the tapes very carefully; and
- transcribe the information on the tapes word for word.

The researcher interpreted data by writing *verbatim* on paper what was contained on the tapes. This means that the data is presented exactly as

educators gave it. To ensure validity and reliability of the accuracy of data interpretation, triangulation was used. Triangulation is the cross-validation among data sources, data collection strategies, time periods and theoretical schemes onto a consistent conclusion (Leedy *et al*, 2005:155). Transcriptions were made of all audio-taped interviews; the researcher compared audio-tapes to transcripts and reviewed each transcript so as to ensure that it contained the *verbatim* recorded interview. These steps were important for the accuracy of the design and for the identification of developing issues, which were to form themes.

There is no single 'right' method that can be used to analyse data (Leedy *et al*, 2005:142). A huge body of information was used in the beginning and through inductive reasoning this information was sorted and categorised and gradually it was reduced to a small set of abstract underlying themes. Data collection and analysis are not independent processes in qualitative research design. While data collection actually entails the process of interviewing, an informal analysis of the respondents was also conducted during the interview. Handwritten assessment notes taken during and after the interviews constituted part of the initial data analysis. An immediate review of audio tapes, a *verbatim* review of the interview transcripts and notes to the methodological log, were additional analysis steps that intertwined with data collection. Thus, analysis was ongoing and occurred during the process of data collection.

In this study, data analysis refers to the process of content analysis. Content analysis is a general term covering a variety of methods for analysing a discussion, message or document for varying themes, ideas, emotions, opinions and so on (Reber *et al*, 2001:152).

Gilgun (2007) suggested that content analysis should be a detailed and orderly examination of qualitative data that can be used to distinguish prototypes, themes, or biases. In this research, the contents of the interviews were analysed to see if educators experience the use of ICTs in teaching visually impaired learners in similar ways, how the

use of ICTs impact on them personally and professionally in their day-to-day functioning and what educators needed as a form of support and training regarding ICTs.

4.7 ETHICAL ASPECTS

Ethical aspects as described by Strydom (2006: 58-68) or morals are matters to hold on to in a research study. No educator may in any way be harmed as a result of participating in the study. The following ethical aspects (as summarised in Table 4.3 below), were adhered to:

ETHICAL ASPECT	ADHERENCE IN THIS STUDY
Informed consent	In this study: ❖ All participants (educators) signed consent forms, a mini session was conducted on information-giving about the goals, process and potential impact of the interviews and that their responses would be made known anonymously as part of research findings; ❖ appointments were made with volunteer educators in their private time (breaks, after school). The date and venue for interviews were determined by participants' preference; and all educators were eager to participate.
Right to withdraw	All educators were told that they had the right to withdraw from this study at any stage and that they had the right to withdraw any of their responses, should they so wish.
Privacy of participants	In this research the participants' privacy was assured by using pseudonyms (e.g. Interviewee 1) and by not documenting information, which might provide clues to their identity.
Deception of participants	Educators in this study were given accurate and complete information on the goal of the investigation, the process of the investigation, the possible benefits, drawbacks and risks to which they may be exposed by participating. There were sufficient opportunities for the participants to ask for clarification on all of these aspects

	before the study commenced.
Release of findings	In this dissertation the findings were reported as accurately as possible. The researcher tried to be objective and to avoid vagueness. Limitations of the findings were noted in the final chapter of this thesis. The researcher avoided plagiarism. The findings were given to all participants.

Table 4.3: Overview of ethical principles followed in this study (Strydom, 2006:58-68)

4.7.1 Trustworthiness of the qualitative research

Qualitative research often relies on an interpretive process. What the researcher believes and has experienced can influence how data is interpreted and this may impact on the trustworthiness of the research (Bogdan *et al*, 2007:37). For instance, in this study, the researcher has a sympathetic tendency towards special schools since he works as a District facilitator with these schools and is, therefore, aware of their needs. It is important for the researcher to think about his own beliefs about the research topic, to increase the 'soundness' (De Vos, 2006:345) of the research (Bogdan *et al*, 2007:37-38).

Lincoln and Guba (1985:301) use the word "believability" to better describe validity and reliability in qualitative research. The researcher needs to provide evidence of what he has done in the study to assist others to believe what he reports and concludes (Lincoln & Guba, 1985:219). Trustworthiness tells how reliable the gathered qualitative data is (Nieuwenhuis, 2007:113-115). Trustworthiness is seen when the collected information is not changed to fit the researcher's interests. Trustworthiness can be discussed under the following headings:

- Credibility

Credibility means that the research findings must be closer to reality (Merriam, 2007), because a qualitative study happens in a real life setting. For this reason the substantiations which the researcher presents must be convincing. That is why Lincoln and Guba (1985:21) argue that qualitative work must be based on data that "speaks to the findings". In other words the researcher should provide sufficient descriptions regarding the setting, program, subjects, procedures, interaction so that boundaries and parameters are well specified. Credibility is similar to internal validity (De Vos, 2006:346). Credibility can be enhanced by member checking, adequate time in the field, triangulation and peer review (Merriam, 2007).

Thirteen participants were interviewed. During the interviews, the researcher restated, summarized, or paraphrased the information received from the respondent to ensure that what was heard was in fact correct (De Vos, 2006:346). Some of the participants were contacted afterwards to confirm what they meant with what they had said.

- Transferability

Transferability refers to the extent that findings can be generalized to other settings, contexts, or populations (Lincoln *et al*, 1985:219). Transferability is similar to external validity (Merriam, 2007). Transferability is not the core of qualitative research (Merriam, 2007), but qualitative data can be hypothesised and allow some transferability to other, similar situations.The researcher must provide readers with enough case information, especially about the context, so that generalizations can be made to similar contexts (Merriam, 2007). The researcher tries to do this in Chapter 5 and also describes the participants adequately.

- Dependability

Dependability relates to what extent the findings of the study might be found again (Merriam, 2007). To determine this, the researcher must describe the context and circumstances in detail (De Vos, 2006:346). The data collection

process and the analysis process should be presented logically, traceably and well-documented (Lincoln *et al*, 1985:187). In other words, the researcher must provide a rich description and an audit trail or detailed explanation of the decisions, methods and procedures which might have influenced the study (Merriam, 2007). This is done in Chapter 5.

- Confirmability

Confirmability refers to the extent that the research can be confirmed or corroborated by others (Lincoln *et al*, 1985:219). In other words, to what extent was the researcher objective? There are certain strategies used to enhance confirmability, like searching for negative cases or conducting a data audit to pinpoint possible bias (Lincoln *et al*, 1985:332).

In order to achieve conformability in this research, the researcher consulted with his supervisor to ensure that he was objective with his interpretations of the data and furthermore he provided his interviewees with a copy of his data analysis and asked them to comment on its accuracy.
Furthermore, to ensure credibility, participants' verbal explanations are extensively quoted. This assisted the researcher to work with data as collected from participants' explanations. In this way it was ensured that participants' explanations were *verbatim* instead of the researcher's own understanding or attachment of meaning.

4.8 CONCLUSION

This chapter presented the research design employed in this study. The next chapter will deal with analyses and interpretation of data.

CHAPTER 5
DATA PRESENTATION, ANALYSIS AND INTERPRETATION

5.1 INTRODUCTION

In this chapter, the researcher will analyse and present the data collected by means of interviews. This data was received through the responses of the participants (N=13) who formed the sample of this research.

Six educators who were interviewed in this study are from an urban school. Five of these educators were females and one was a male. Their qualifications range from teacher diplomas to degrees in different fields such as human resources and technology. From the six educators, one educator is a Braille specialist who can convert normal prints of all subjects, including Mathematics and Physical Science to Braille format.

Seven educators who were interviewed are from a semi rural area. Five of these educators were females whilst two of them were males and they were semi-blind. Their qualifications range from teacher diplomas to degrees in different fields such as Social Sciences.

The aim of this research was to investigate the use of ICTs in schools for visually impaired learners.

5.2 REALISATION OF ETHICAL CONSIDERATIONS AND SAMPLING

It was discovered during the research process that the participants were eager to take part in the research. From their responses the basic reason for this seems to be that they felt the study phenomenon is important as it could allow them to vent their apparent frustration regarding the availability and use of ICTs in their respective schools when teaching visually impaired learners. Two of these educators had the following to say regarding their frustration with the current state of affairs at their schools:

Educator one said: *"I encounter problems in that our school, all the visually impaired, the partially sighted learners and the blind learners are in one class. So the problems that we encountered are that we are not able to give individual attention to all of them because they are not separated. And another thing like I say is material because material for the blind and the partially sighted children is very expensive"*

Educator two said: *"Ehh, as I said earlier on, time is a vital thing, you know, it would be actually interesting if you can ehh attend one of my classes because I basically need to convey knowledge twice. I must first pay attention to the partially sighted, I normally explain things to them underneath a camera, and I try to enlarge things for them, give them notes on the work that we are busy with, then I have to move over to the Braille kids and the approach is totally different from that of a partially sighted because that requires a lot of personal attention to a specific kid. And then see what he is writing down, and if it is correctly done. And with Science and Maths, You must know exactly the layout of what Braille requires to a specific problem and so forth".*

These responses emanated from the following question: What type of problems do you sometimes encounter when you teach visually impaired children? These responses clearly showed that there are challenges regarding the execution of teaching visually impaired learners in schools for the visually impaired since educators in these schools have to take it upon themselves to teach visually impaired learners without support and appropriate supportive material, such as ICTs, which could make their job easier.

The eagerness to discuss challenges faced by educators ensured that the interviews took place successfully and yielded genuine responses from the participants. Furthermore, the approval letter from the Gauteng Department of Education to conduct the research added some weight and helped the researcher to gain the trust and goodwill of the participants.

Data collected by means of interviews will be analysed and interpreted by means of themes.

5.3 RESULTS

5.3.1 Question 1

In your view, what do you understand by Inclusive Education?

The purpose of this question was to find out the extent to which educators in the schools understand and interpret inclusion for visually impaired learners as it brought the promise of the provision of LTSM, including ICTs.

Findings and conclusions:

THEMES	EDUCATOR RESPONSES
Accommodating learners with special needs **Eight (61%)** educators	" all learners, including learners with barriers to learning, are all taught at the same time" (C4);

Table 5.1: Definition of inclusive education

The theme of this question relates to inclusive education as a system of education that acknowledges, supports and accommodates learners with visual impairments. Support can be in the form of visually impaired learners being able to access curriculum content which can be possible through the supply and use of relevant LTSM and ICTs (c.f.2.2.1).

All the participants seemed to understand the concept of inclusive education but made it clear that South Africa's inclusive education policy promised the provision of resources to support the visually impaired learner. These resources include learning support material such as ICTs. This promise is yet to be realised.

The findings in this item of the interview questionnaire highlighted that the Department of Education still has to keep its end of the bargain with regards to the provision and the use of learning material such as ICTs to support learners

with visual impairments during learning and teaching as per the provisions of the inclusive education policy.

5.3.2 Question 2

How relevant do you think is inclusive education to the visually impaired?

The purpose of this question was to find out the extent to which educators in the participating schools perceive the relevance of inclusive education to the visually impaired learners.

Findings and conclusions:

THEMES	EDUCATOR RESPONSES
1. Resources (funding and LTSM) **Nine** (69%) educators	"… we don't have the funding to facilitate these things in the mainstream schools". (H6) " …we are lacking the materials" (G 7);
2. Training **Four** (23%) educators	" …most of the educators are not trained to teach the visually impaired learners" (A9)

Table 5.2: Relevance of inclusive education towards visually impaired learners

Theme 1 can be explained as follows:

In the first theme educators judge the relevance of inclusive education against the availability of LTSM such as ICTs. It was envisaged that resources (human and financial) would have been made available from the National Department of Education to special schools, including schools for the visually impaired learners (DoE, 2001:40) to ensure the successful implementation of inclusive education. The availability of resources, specifically LTSM, such as ICTs, will

help in ensuring the success of inclusive education in schools for visually impaired learners (c.f.2.3.3). Current literature does suggest that so far, these resources are not yet available to special schools for visually impaired learners, (Wildeman & Nomdo 2007:1) (c.f.2.5).

Theme 2 can be explained as follows:

Since the Department of Education is expected to play a key role in building institutional capacity and in managing the introduction of the inclusive education and training system (DoE, 2001:46) it is expected that training regarding LTSM should also be provided. Thus far there is little or no training taking place for educators in special schools regarding how to teach and support visually impaired learners, which was to include training in the use of ICTs. Current literature confirms that educators are not trained on the support, tuition and use of LTSM to teach visually impaired learners (Eloff *et al*, 2007:352; Sukhraj, 2006:3) (c.f. 2.5).

The majority of educators in the sample indicated that they are unable to teach visually impaired learners due to the lack of relevant ICTs and LTSM as a result of lack of funding from the Department of Education and as such inclusive education is irrelevant to them. The findings on this item of the interview questionnaire highlights that the Department of Education, as a custodian of schools for the visually impaired should supply the relevant Learning, Teaching, and Support Materials (LTSM), as well as ICTs, to schools for visually impaired learners. Consequently, funds by the Department of Education should be made available to schools for the visually impaired learners so that these schools can be able to procure relevant ICTs and other related resources. The procurement of support material such as ICTs will enhance opportunities for learners with visual impairments to learn better (c.f.2.10).

5.3.3. Question 3

Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

The purpose of this question was to find out the extent to which educators are qualified to teach in schools for the visually impaired.

Findings and conclusions:

THEMES	EDUCATOR RESPONSES
1. Irrelevant qualifications **Seven** (54%) of educators	"Ok, I got my teaching Diploma, I've got my B.Sc. degree in my different subjects, I teach Maths and Physical Science" (H20).
2. Relevant qualifications **Six** (46%) of educators	"Advanced certificate in Special needs with visual impairments' (F18).

Table 5.3: Educators qualifications

Theme 1 and 2 can be explained as follows:
Seven teachers do not have any training related to the visually impaired learner. Nel (2007:7) states that most educators have inadequate or many times irrelevant qualifications to be able to teach learners who experience barriers to learning (c.f.3.5.1).

5.3.4 Question 4

Have you received any training with regard to identifying, assessing and supporting different barriers to learning that the visually impaired learner's experience?

The purpose of this question was to find out the extent to which educators have received training on identifying, assessing and supporting different

barriers to learning that the visual impaired learner experience. It is important to establish this, as all the mentioned issues are necessary for the appropriate use and implementation of ICTs.

Findings and conclusions:

THEMES	EDUCATOR RESPONSES
1. In-service training **seven (54%)** educators	"…I think its in-service training. I come from the mainstream school. That's my background. I have not received any specific training other than the training I received at school. I did receive in-service-training" (I12).
2. No pre-service and in-service training **Six (46%)** educators	"Everything that I know about the training for the blind and the visually impaired I basically taught myself" (H15).

Table 5.4: Educator's preparedness

Theme 1 can be explained as follows:

Most of the educators did receive some form of in-service training in the identification, assessment and support of the barriers to learning that the visual impaired learner could experience. However, when the researcher asked more in-depth questions regarding this most educators still felt unprepared with regard to these issues. Some mentioned that the training was mostly theoretical and still did not prepare them to implement the knowledge in practice. This will have a negative impact on the appropriate use of ICTs in addressing every visually impaired learner's specific barriers and needs.

According to Eloff *et al* (2007:352) educators need support from the Department of Education in the form of pre-service and in-service training with regard to the identification of barriers that are experienced, including visually impaired learners who are in specialised schools.

Theme 2 can be explained as follows:

Six educators indicated that they received no official training with regard to the identification, assessment and support of barriers to learning that learners with visual impairments can experience, but mostly taught themselves Braille reading and how to use the different ICTs available in their respective school. Since the use of ICTs requires quite specific technical knowledge, this can be judged as a concern. If ICTs are not correctly implemented to address the specific barriers and needs of visual impaired learners it could disadvantage their optimal learning (c.f. 3.4). Current literature suggests that proper training of educators to teach learners with varying disabilities, including the visually impaired, is still lacking (Wildeman *et al*, 2007:3 and Sukhraj 2006:3) (c.f. 2.3.1).

The majority of educators in the sample stated that they are not fully trained to teach visually impaired learners due to their inability (they feel) to identify, assess and support barriers experienced by visually impaired learners in their respective special schools. They attribute much of this to the Department of Education since White Paper 6 committed to training all educators appropriately (c.f.2.5.3).

The findings on this item of the interview questionnaire highlight that the educators in schools for the visually impaired learners should thoroughly be equipped on how to identify, assess and support visually impaired learners in order to be able to use ICTs appropriately for individual needs of learners with visual impairments.

5.3.5 Question 5

Could you indicate what the in-service training entailed?

The purpose of this question was to find out about the specific training that was offered to educators during in-service programmes in their respective schools.

Findings and conclusions:

THEMES	EDUCATOR RESPONSES
1. Braille training **Eleven** (85%) educators ICTs training **Six** (46%) educators	" the training that I got is Braille" (A21) "I did receive In-Service-Training. And I think it's a continual thing because if we buy new machinery or apparatus, then we are trained on the use of it. (I12)
2. Skills for daily living Five (38%) educators	"We were trained on low vision; so that we can help children who have low vision we were trained in orientation and mobility. We were trained on skills for daily living"(C15)

Table 5.5: Educator training

Theme 1 can be explained as follows:

Most educators indicated that they have received some in-service training with regard to Braille, however it does not seem that Braille related to ICTs have

been addressed (c.f.2.3 and 2.5.3). This is reflected in Hay *et al* (2001:218) wherein an overwhelming number of educators indicated that they are open and willing to learn more about Braille, but do not get the opportunity.

Six educators from an urban school for visually impaired learners indicated that they did receive in-service training on the use of ICTs. In-service trainings on the use of ICTS are necessary because they equip educators who teach visually learners (Freire, Linhalis, Bianchini, Fortes & Pimentel, 2010:874).

Theme 2 can be explained as follows:

Educators from the second school in the more rural area were offered some in-service training regarding different levels of acuities, mobility and day to day living skills of visually impaired learners. However, no training with regards to ICTs was presented and as such these educators generally feel that not much of the training that was presented made them confident enough to teach visually impaired learners (Motshwane, 2007:53) (c.f.2.3.1 and 3.5.1).

From the responses it also seemed evident that the educators from the urban school (school 1) were better trained with regard to Braille and the use of different ICTs and they could support specific learners better with regard to their daily living needs. However, it seemed that educators from the rural school (school 2) still lacked appropriate training regarding these issues.

It must also be stressed here that an initiative was taken by the selected schools regarding some kind of training on the use of ICTs. This training was conducted by more experienced colleagues at each school and no government agency was involved.

5.3.6 Question 6

How would you describe your skills regarding the above mentioned training?

The purpose of this question was to find out the extent to which educators have acquired skills with regard to the trainings they received in 5.3.5 above.

Findings and conclusions:

THEMES	EDUCATOR RESPONSES
1. Skilled in Braille **Eight** (62%) educators 2. Unskilled in ICTs? **Seven** educators	" I am well skilled, that is why I am a senior teacher" (I16) "I have no skills" (B24).

Table 5.6: Educator's skills on Braille and ICT use this theme can be explained as follows:

Educators from the urban school (school 1) indicated that they are well trained in Braille and the use of different ICTs available in their school, but the educators from the rural school (school 2) indicated that they lacked skills and competence in Braille and ICT use (c.f. 2.3.1).

The majority of educators in an urban area (school 1) are better skilled in Braille than educators in the school for visually impaired learners in a rural area (school 2). The findings on this item of the interview questionnaire highlight that the Department of Education should offer training and development on Braille to all educators in special schools for the visually impaired learners since Braille systems where Braille translation softwares are used for converting normal print to Braille is one of the major ICT tools with which learning takes place (c.f.3.7.1).

5.3.7 Question 7

What type of problems do you encounter when you teach visually impaired children?

The purpose of this question was to find out the extent to which educators come across problems in the tuition of visually impaired learners in special schools.

Findings and conclusions:

THEMES	EDUCATOR RESPONSES
1. Lack of LTSM **Seven** (54%) educators	"Because sometimes we receive some materials from the department and that material is not for the blind learners" (B9).
2. Large classes Six (46%) educators	"I encounter problems in that our school, all the visually impaired, the partially sighted learners and the blind learners are in one class. So the problems that we encountered are that we are not able to give individual attention to all of them because they are not separated" (C25).

Table 5.7: Areas of support

Theme 1 can be explained as follows:

Theme 1 relates to the availability of LTSM such as ICTs in schools for visually impaired learners. According to Eloff *et al.* (2007:354) there are currently still insufficient resources in Braille format and relevant ICTs and this is one of the challenges experienced by educators in schools for the visually impaired (c.f.2.5).

Theme 2 can be explained as follows:

Theme 2 relates to the number of visually impaired learners in each classroom. The educators mentioned that they are teaching a high number of learners in an inclusive classroom, who have different visual acuities, and that this makes

it difficult for them to adequately teach these learners according to their specific needs. This can be linked to poor strategic campaign and integration strategies for inclusion of marginalised children and learners with visual impairments (Wildeman *et al*, 2007:3) (c.f.2.5.2). Since ICTs demand individual support and time, a classroom with many learners with a diversity of visual impairments will cause many barriers to the successful implementation of ICTs (c.f.3.5.2).

The Department of Education should supply LTSM in Braille and other relevant ICTs to all schools for visually impaired learners, and also implement the policy which states that the ratio of class numbers cannot be too large (De Lannoy & Hall, 2010:2).

5.3.8 Question 8

Do you use Information Communication Technology (ICT) tools when teaching visually impaired learners?

The purpose of this question was to find out to what extent educators in schools for visually impaired learners use ICTs when teaching learners with a visual impairment.

Findings and conclusions:

THEMES	EDUCATOR RESPONSES
1. Use of ICTs **Eight** (62%) educators use ICTs	"…obviously we use a computer a lot. Eh electronic copies of whatever we have, electronic copy of Braille, and how to equip and how to print your own learning material and then of because you need a lot of knowledge on eh CCTV cameras, how they are adapted, and I teach languages, so what I needed to teach with what they taught me at school was how to use the MAX mouse for dictionary work where learners could be able to use that" (L25).
2. No use of ICTs **Five** (38%) don't use ICTs	"Mmmm, at the present moment, in the Foundation Phase we don't use any computer or any ICT" (A42).

Table 5.8: The use of ICTs in special schools for the visually impaired learners

Theme 1 and 2 can be explained as follows:

This finding revealed that educators in the urban school (school 1) for the visually impaired do make use of a variety of ICTs when they teach visually impaired learners and that they believe that there are a number of benefits attached to ICT use when teaching visually impaired learners (c.f.3.5.2). However, no educator in the rural school (school 2) uses ICTs in teaching visually impaired learners in the rural school since they do not have them

available. The educators of this school gave the high cost of ICTs as the main reason why this was the case at their school, and that the Department of Education does not provide these much needed equipment to schools.

This is a concern since ICTs can have a huge and a positive impact on the optimal learning of learners with a visual impairment (c.f.chapter 3).

5.3.9 Question 9

Who supplies you with all the tools you mentioned above?

The purpose of this question was to find out how do schools for visually impaired learners acquire ICTs if they have.

Findings and conclusions:

THEMES	EDUCATOR RESPONSES
1. Procured through school funds and donations **Thirteen** (100%) educators	"First of all, most of the tools are provided through or are obtained through fund raising. The school raises funds and we buy these or donations" (I 31).

Table 5.9: Supplier of tools

This theme can be explained as follows:

This theme relates to how do schools for visually impaired learners acquire ICTs if they have them available. From the responses it seems that ICTs that are available were acquired through donations and fund raisings. Although White Paper 6 (DoE, 2001:40) mentions that, through its funding strategy special schools will receive resources, till today the Department of Education is

yet to supply ICT resources (c.f.2.3.2). This is a concern since inclusive education through White Paper 6, promises that learners experiencing barriers will be supported in any means possible, which includes providing LTSM, such as ICTs. This could hamper the optimal learning of learners with visual impairments and result in these learners not realizing their full potential.

5.3.10 Question 10

Did you receive any form of training / workshop on how to use ICTs you mentioned when you teach visually impaired learners?

The purpose of this question was to find out the extent to which educators are trained on the use of available ICTs.

Findings and conclusions:

THEMES	EDUCATOR RESPONSES
1. In-service training **Seven** (54%) of educators	"Yes, not formal workshop, but internally with the schools systems, eh usually they helped me as the new comer and my job is to help all the others" (L 20).
2. No training **Six** (46%) of educators	"In fact we are supposed to receive them, but eh we do have a computer lab here, we were told that we will get training, but we don't get that training" (E40).

Table 5.10: Training on supplied tools

Theme 1 and 2 can be explained as follows:

Theme 1 and 2 relate to the training that educators in schools for visually impaired receive after other tools or ICTs are made available. Table 5.13 indicates that when a resource is acquired by the school in an urban area (school 1), colleagues in the same school for the visually impaired, who are experienced on how to use that specific ICT, offer in-service training to those who do not know how to use that specific tool (Freire *et al* 2010:878). Since the rural school (school 2) does not have ICTs available none of their educators were trained in the use of it.

Since White Paper 6 commits to training educators to be able to teach and support learners with various barriers to learning it is concerning that the schools have to fend for themselves in becoming appropriate users of ICTs.

5.4 CONCLUSION

From the data analysed and interpreted the following conclusions can be made:

- the school (school 1) in an urban area does have ICTs that they can use during tuition, whilst the school (school 2) for the visually impaired in a rural area lack resources in Braille and ICTs ;
- no other tools except Braille machines are used in the rural school (school 2) for visually impaired learners, whilst ICTs are used during tuition of visually impaired learners in the school in an urban area (school 1);
- in school 1 ICTs are procured through school funds and special donations; and
- educators were trained by more experienced colleagues, but no formal training in ICTs was provided by governmental agencies. Educators in school 2 in the rural area do not use ICTs and are therefore not trained, but would like to be trained.

5.5 OVERALL CONCLUSION REGARDING THE USE OF ICTs IN SPECIAL SCHOOLS FOR THE VISUALLY IMPAIRED LEARNERS

The identified themes among educators at these specific schools in the Gauteng Province, explore the areas in which educators need support for the use of ICTs in schools for the visually impaired. The two selected schools of educators focused on a perceived lack of skills and training, large classes and a lack of resources. This implies that if these conditions are alleviated then educators' use of ICTs in supporting the needs of visually impaired learners in schools for the visually impaired would be better if adequate training, reasonable classroom sizes and relevant LTSM / ICTs are in place.

In the next chapter conclusions and recommendations are made.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

The use of ICTs in schools for visually impaired learners has been researched for a long time (Kennewell & Beauchamp, 2007:227). However, it is clear that the benefits and the power of ICTs on learners' achievements, including visually impaired learners, importantly depends on the educator, the educational approach adopted, the ICT resources used and the objectives intended (Kennewell *et al*, 2007:227).

This chapter provides a summary of the findings of this study as well as conclusions inferred from the study. Limitations, contributions, as well as recommendations for further study will also be provided in this chapter.

Conclusions and recommendations in this chapter will be made with regard to research questions which were formulated as follows in 1.3 of chapter 1 and chapter 4.

6.2 SUMMARIES OF BOTH LITERATURE REVIEW AND EMPIRICAL RESEARCH

This section provides both the summaries from the literature review and empirical research.

6.2.1 Research question 1

What are the educational needs of learners experiencing visual impairments within an inclusive education system?

The educational needs of visually impaired learners were presented in chapter 2. This chapter provided background regarding inclusive education which South Africa has adopted through the White Paper 6 and the implications thereof for visually impaired learners in the education system. Since an

inclusive education system provides equally for all learners, including learners who experience barriers to learning the advantages of inclusive education for visual impaired learners were emphasized. The aim of inclusive education is to provide education in such a way that the diverse needs of every learner are addressed, including learners that experience visual impairments. The different visual impairments and their educational needs were explored in this chapter and it was found that a core curriculum with specific adaptations can address the educational needs of the visual impaired learner. However, support systems, proper support material, such as ICTs and adequately trained educators must be in place.

The empirical study indicated that educators at the participant schools are quite aware and informed about how the diverse needs of learners with visual impairments should be addressed within an inclusive system. However, the participants felt that large numbers of learners with a diversity of visual impairments in their classrooms present difficult challenges. The participants also indicated that an added frustration is that not much Learning and Teaching Support Material and specifically ICTs are provided by the Department of Education or inappropriate material is supplied. Formal training to address all these challenges is also not provided.

One way to support the adaptation of curriculum is the use of different Learning Support material. Since this study focuses on ICTs this was investigated in the next chapter.

6.2.2 Research question 2

Which ICTs are suitable for learners who experience visual impairments?

ICTs which are suitable for visually impaired learners were discussed in chapter 3. The following crucial ICTs were identified after a thorough literature search was conducted:

- Interactive Classroom Television Systems (ICTS) that improve continuous communication among educators, peer groups and visually impaired learners (Bikson, Bikson & Genensky, 1979);
- Braille Embossers which is a printer that renders text as Braille. Utilizing special translation software, a print document can be embossed with relative ease, making Braille production much more efficient and cost-effective. (Farnsworth & Luckner, 2008:171);
- OCR (Optical Character Recognition) Software: OCR software allows educators to scan and digitize printed materials that can then be printed out or read onscreen in larger fonts for students with low vision (Farnsworth *et al.* 2008:171);
- Other ICTs that can be used are Screen Magnifiers / Large Print; Screen Readers / Talking Web Browsers; Braille Music Translation Software; Adaptive Keyboards & Mice and Cursor Enlargers (EBSCO, 2008:4).

In the empirical study the participants from the urban school (school 1) indicated that they are quite aware of the available ICTs and that many of them have been acquired though fund raisers and donations. Unfortunately, since the funds are not available at the rural school (school 2) and parents are from poor socio-economic circumstances no ICTs are available at this school.

6.2.3 Research question 3

How can both the learner and the educator in the school for the visually impaired use ICTs in the process of teaching and learning?

This was also addressed in chapter 3 after a comprehensive literature study. During tuition, educators can teach visually impaired learners through individualized computer-based learning programmes: visually impaired learners are involved in their own learning and can consequently improve their investigative learning skills; communication among all learners as well as the visually impaired learners is enhanced (Florian, 2004:7); and ICTs can be used

as a management tool, e.g., through Individualized Education Programmes (ISPs) (Wilkens, 2004).

Again it was found that the participants from the urban school (school 1) are well informed about the advantages of using ICTs in the classroom and are actually implementing them in their teaching. Though, the rural school (school 2) does not have ICTs and the participants were never trained in using ICTs some indicated that they are aware of these tools and the advantages thereof for their teaching.

6.2.4 Research question 4

In what way can the use of ICTs enhance learning for learners' experiencing visual impairments to learning?

In chapter 3 it was explained through a literature search that the use of ICTs can contribute in teaching a visually impaired learner in totality, because other senses like hearing and touch are explored (Jakovljevic, 2002:31). Crabtree, Nathan and Reeves (2002:19) assert that the quality of teaching is improved when ICTs are used. Kennewell and Beauchamp (2007:231) emphasize that ICTs can enhance the speed of learning, make learning more automated, and allows access to a large number of learning materials.

From the responses in the empirical study it seemed that participants from both schools are cognizant of the fact that ICTs can enhance learning for the visual impaired learner.

6.2.5 Research question 5

Are educators of schools for the visually impaired trained to use ICTs for visually impaired learners?

It was found through the empirical study that most educators in both the participant schools that took part in the study do not have specific formal

training to teach learners with visual impairments. Many of them indicated that some in-service training does take place, but that it is generally conducted by more experienced colleagues at the school. No formal in-service training is provided by any official government agency. The participants also indicated that little or no official training for educators in these schools takes place regarding ICTs. The only training regarding ICTs that was reported by the participants was again conducted by more experienced educators at the urban school (school 1) since they have ICTs that were acquired through fundraisers and donations. The second school (school 2) in the rural area does not have ICTs and therefore the participants reported no training regarding ICTs. Current literature confirms that many educators are not trained on the support, tuition and use of LTSM to teach visually impaired learners (Eloff & Kgwete, 2007:352; Sukhraj, 2006:3)

6.3 RECOMMENDATIONS

This section provides recommendations for the practical implementation of the use of ICTs in special schools for visually impaired learners.

6.3.1 Availability of ICTs in schools for visually impaired learners

- The Department of Education as well as the schools for the visually impaired, in both urban and rural areas, should budget and then actually acquire ICTs to ensure that within an inclusive education system visually impaired learners are taught and supported in the best way possible to ascertain their optimal potential.
- The Department of Education should make sure that every school for visually impaired learners has an ICT centre (c.f.3.6) as well as a library with Braille materials so that visually impaired learners can do their references as well support their learning.
- There should be well-equipped computer laboratories at every school for the visually impaired wherein each visually impaired learner can be able to access a computer. In other words, all schools' computers should have the educational software needed for learners with visual impairments to perform lesson activities (c.f.3.7.5).

- Moreover, there is a need for more computers in the classrooms itself, probably four or five for visually impaired learners as well as educators to use during teaching and learning activities.
- The ICTs need to be relevant to the curriculum content and be integrated in the curriculum (c.f.3.5.1).
- It is also vital that schools for visually impaired learners should work in partnership with computer software service providers who specialize in computer technology in teaching and learning or educationally related issues, in order to select/choose, develop or translate educational software computer applications for all grades and learning areas/subjects.
- This also necessitates that schools for the visually impaired employ educators with knowledge and skills of computer technology.

6.3.2 The training of educators in schools for visually impaired learners on how to use ICTs

- A process that intends to improve the skills of educators must be established by the Department of Education as well as the schools. There must be a continuous development and capacity building of knowledge and skills of educators.
- Basic technical skills on how to use the computer, on how to use basic software, as well as ICTs should be part of the training envisaged above.
- Training programmes should include knowledge and skills on how to integrate different ICTs within the curriculum to ensure that ISPs are appropriately designed and implemented for visually impaired learners.

6.4 LIMITATIONS OF THE STUDY

The following limitations are noted:

- The interviews were carried out using only 13 special school educators from two schools for the visually impaired; The size of the sample is small and so no generalizations can be made from the study;

- the educators who participated in this study come only from two districts and two different areas in the Gauteng province. This means that one cannot assume the same for all districts and areas; and
- the study was limited to educators from schools for the visually impaired on the use of ICTs in these schools only. A comprehensive study of general use of ICTs in education should be conducted in all schools who provide for different barriers to learning as well as in the mainstream schools. The training needs of educators in these schools specifically to support learners with barriers to learning should also be determined and addressed.

6.5 CONTRIBUTIONS MADE BY THE STUDY

The study makes the following contributions:

This study highlighted the issue that ICTs are essential tools for the visually impaired learner to enhance their learning. It also drew attention to the fact that despite the commitments of White Paper 6 schools are still not supplied with appropriate ICTs and that proper training for all educators to use these ICTs are not conducted.

6.6 RECOMMENDATIONS FOR FURTHER STUDY

The use of ICTs by educators in schools for the visually impaired is a multifaceted phenomenon. It is therefore hoped that this study will motivate other researchers to conduct further studies, such as:

- a larger study regarding the use and advantages of ICTs in all the schools for the visually impaired;
- a study determining the knowledge and training of Departmental official concerning ICTs and the advantages thereof for visual impaired learners; and
- the development of a programme that will assist the Department of Education to empower educators in schools for the visually impaired to be able to use ICTs in teaching such learners.

6.7 CONCLUSION

It is important for educators in schools for visually impaired learners to use different ICTs since it can improve the possibilities of learners with visual impairments to achieve their full learning potential. Educators in different education settings should be trained on the use of ICTs in teaching learners with specific visual impairments as they need to accommodate and teach learners with different visual impairments in an inclusive environment. It is also important that educators of visually impaired learners be continuously empowered to meet the resultant challenges as well as on the use and benefits of ICTs during teaching and learning.

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ADDENDUM A

INTERVIEW QUESTION

1. In your view, what do you understand by Inclusive Education?

2. How relevant do you think is Inclusive education to the visual impaired?

3. How would you describe barriers to learning? What type of barriers to learning do you think learners with visual impairments experience?

4. Have you received any training with regards to identifying, assessing and supporting different barriers to learning that the visual impaired experience?

5. Could you indicate what the training entailed?

6. How would you describe your skills regarding the above mentioned training?

7. Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

8. Did you receive any training / workshop about Inclusive Education? What type of training did you receive?

9. What type of problems do you sometimes encounter when you teach visually impaired children?

10. Which Information Communication Technology (ICT) tools do you use when you teach visually impaired learners?

11. Do you use any other tools except ICT mentioned in (10) above?

12. Who supplies you with all the tools you mentioned above?

13. Did you receive any form of training / workshop on how to use these supplied tools you mentioned when you teach visually impaired learners?

14. As an educator for visually impaired learners, what do you think you could do for betterment of education for the visually impaired learners?

ADDENDUM B

INTERVIEW MANUSCRIPTS

INTERVIEW A

A1: INTERVIEWER: Good Morning

A2: INTERVIEWEE: Good Morning, Sir

A3: INTERVIEWER: In your view, what do you understand by Inclusive Education?

A4: INTERVIEWEE: Inclusive, neh, it an education system which allow learners to learn everywhere you know, where they choose to learn. And it doesn't even involve learners who are experiencing barriers eeeh disabilities, but involves the inclusion and the changing of the teaching methods.

A5: INTERVIEWER: Ok. How relevant do you think is Inclusive education to the visually impaired?

A6: INTERVIEWER: Do you think inclusion Education caters for the visually impaired learners?

A*7: INTERVIEWEE: (e re ke bone – let me see). Not yet.*

A8: INTERVIEWER: Why do you say not yet?

A9: *INTERVIEWEE: Not yet because most of the peoples most of the teachers are not trained to teach the visually impaired learners.*

A10: INTERVIEWER: How would you describe barriers to learning?

A11: INTERVIEWEE: A barrier to learning is something which makes a learner not to learn in a way she is supposed or he supposed to learn.

A12: INTERVIEWER: Can you give me an example of a barrier?

A13: INTERVIEWEE: Ja, a barrier is when a learner, maybe, is experiencing a problem in accessing information, neh, that is a barrier especially with the blinds, because they cannot access information, they do not have enough books, that's a barrier. And again a barrier can be a medical condition which prevents a learner to learn.

A14: INTERVIEWER: What type of barriers to learning do you think learners with visual impairments experience?

A15: INTERVIEWEE: I should think sometimes the system, because the system it is also a barrier. When the system does not cater the education system does not cater for our learners. For an example, in our school when we receive documents from the department, when we write our annual

assessments, you find that our papers are not adapted to suit our learners.

A16: INTERVIEWER: Have you received any training with regards to identifying, assessing and supporting different barriers to learning that the visual impaired experience?

A17: INTERVIEWEE : Hm, I think its through my experience, I didn't receive any training, but I taught myself how to identify eeeh a barrier to learning, not only on the visually impaired, but identifying ,you know an on a brought scale, because I did honors in learner support.

A18: INTERVIEWER: Ok

A19: INTERVIEWEE: That's where I got my training

A20: INTERVIEWER: Could you indicate what the training entailed?

A21: INTERVIEWEE: the training that I got is Braille.

A22: INTERVIEWER: Braille?

A23: INTERVIEWEE: Ja, I was trained Braille by OPTIMA in Pretoria.

A24: INTERVIEWER: Ok

A25: INTERVIEWEE: *The mode of writing for the blind.*

A26: INTERVIEWER: Ok. How would you describe your skills regarding the above mentioned training? Are you well skilled?

A27: INTERVIEWEE: (laughing) yes, I can say that, I am because I am able A28: to transfer the knowledge that I have, at the present moment I am having a group at the district office, and then I am training them in Braille. So **…**

A29: INTERVIEWER: Are you comfortable with your training?

A30: INTERVIEWEE: Yes.

A31: INTERVIEWER: Ok

A32: INTERVIEWEE: Ja (laughs)

A33: INTERVIEWER: Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

A34: INTERVIEWEE: I've got eeh an honors degree, where I was doing learner support, and the areas that we touch, we also touched visually impaired, even though we didn't go in depth, but I did that in my honors.

A35: INTERVIEWER: Did you receive any training / workshop about Inclusive Education? What type of training did you receive?

A36: INTERVIEWEE: Yes, I did. I've gone to a lot of workshops and I also eeh learned about inclusive education in my B.Ed (Honors) we did that and intensive training on inclusive education

A37: INTERVIEWER: Ok. What type of problems do you sometimes encounter when you teach visually impaired children?

A38: INTERVIEWEE: Eeeeh sometimes you find that most of the things in our curriculum, there are there is somewhere where they say the learners must visualize and it is a problem for somebody who had not seen a thing to visualize something. So, it becomes a problem.

A39: INTERVIEWER: Ok.

A40: INTERVIEWEE: Cause they cannot visualize that, and then another problem is that when we assess them, you find that some of the assessment forms, are not applicable to the blind.

A41: INTERVIEWER: Which Information Communication Technology (ICT) tools do you use when you teach visually impaired learners?

A42: INTERVIEWEE: Mmmm, at the present moment, in the Foundation Phase we don't use any computer or any ICT.

A43: INTERVIEWER: So you don't have any ICT tools that you use?

A44: INTERVIEWEE: No, no we don't.

A45: INTERVIEWER: Who supplies you with all the tools you mentioned above? Who must supply you?

A46: INTERVIEWEE: I don't know because most of the times the department

A47: INTERVIEWER: But are they supplying you with the tools?

A48: INTERVIEWEE: Eeeh, we got Gauteng On Line, but most of the things the blind cannot access the information in there because the computers are not suitable for the blinds learners.

A49: INTERVIEWER: Did you receive any training on Gauteng On Line?

A50: INTERVIEWEE: No.

A51: INTERVIEWER: No?

A52: INTERVIEWEE: Hm (meaning yes).

A53: INTERVIEWER: As an educator for visually impaired learners, what do you think you could do for betterment of education for the visually impaired learners?

A54: INTERVIEWEE: I should think, I don't know, what I can do is to advice the universities, when the teachers are trained during their first year, they should also train them on teaching the visually impaired, because we are having a high rate of people turning blind now. So if may be from course one when they do teaching, they should teach them how to deal with all the disabilities, especially the visually impaired, because that's an area where people are not trained intensively.

A55: INTERVIEWER: Thank you very much, Mom I have enjoyed my interview.

A56: INTERVIEWEE: Thank you.

INTERVIEW B

B1: INTERVIEWER: Good Afternoon Mom

B2: *INTERVIEWEE: Good Afternoon sir.*

B3: INTERVIEWER: In your view, what do you understand by Inclusive Education?

B4: *INTERVIEWEE: Ok, inclusive education, I think, in education everybody should be included, the blindness, and also those who are physically disabled. Everybody should be included.*

B5: INTERVIEWER: How relevant do you think is Inclusive education to the visually impaired?

B6: INTERVIEWER: (paraphrasing the question) Do you think learners who are blind are catered for by inclusive education?

B7: *INTERVIEWEE: No, I don't think they are catered.*

B8: INTERVIEWER: Why do you think so?

B9: *INTERVIEWEE: Because sometimes we receive some materials from the department and that material are not for the blind learners.*

B10: INTERVIEWER: can you give me an example of the material which you receive which is not relevant for blind learners?

B11: *INTERVIEWEE: Oooh, like maybe, like when we receive posters are only for the, for the large prints, for the learners who can see blinds because blind children, they use, they only use their hands to feel, so these posters they are not written in Braille***.**

B12: INTERVIEWER: How would you describe barriers to learning?

B13: *INTERVIEWEE: I think barriers to learning is their blindness and also the children that are blind, they are not only blind, but blindness has affected their brains.*

B14: INTERVIEWER: What type of barriers to learning do you think learners with visual impairments experience?

INTERVIEWER: What disturbs them to learn?

B15: *INTERVIEWEE: I think it's their blindness, because they can see. if you teach them about the sun, they can see, they don't know the shape of the sun. You have to explain the sun is like and is like this. So I think it's a problem because everything you teach them, they should feel it because they can see it.*

B16: INTERVIEWER: So it means in most of your teaching you use objects?

B17: *INTERVIEWEE: Yes, in most of my teachings I use objects.*

B18: INTERVIEWER: Objects like what?

B19: *INTERVIEWEE: Like counters, if we do counting, we use counters if we do shapes, I use some shapes.*

B20: INTERVIEWER: Have you received any training with regards to identifying, assessing and supporting different barriers to learning that the visual impaired experience?

B21: *INTERVIEWEE: No I haven't received any training.*

B22: INTERVIEWER: Could you indicate what the training entailed?

B23: INTERVIEWER: How would you describe your skills regarding the above mentioned training?

B24: *INTERVIEWEE: I have no skills.*

B25: INTERVIEWER: Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

B26: *INTERVIEWEE: No, I only have a Junior Primary Teachers Diploma, not for visually impaired.*

B27: INTERVIEWER: Now how, who helps you to teach these learners?

*INTERVIEWEE: Hmmm, my colleague, Mrs. Hlubi. She is one who is helping me out to design materials, everything, she help me a lot***.**

B28: INTERVIEWER: Did you receive any training / workshop about Inclusive Education? What type of training did you receive?

B29: *INTERVIEWEE: No I didn't.*

B30: INTERVIEWER: What type of problems do you sometimes encounter when you teach visually impaired children?

B31: *INTERVIEWEE: Like maybe when you want to introduce the concept, you have to think what kind of objects will you use so that they could understand. So it's a problem.*

B32: INTERVIEWER: Which Information Communication Technology (ICT) tools do you use when you teach visually impaired learners?

B33: *INTERVIEWEE: No, in Foundation phase we don't use any tool. We don't use a computer.*

B34: INTERVIEWER: What do you use then?

B35: *INTERVIEWEE: No we use counters, objects, we use objects.***B36: INTERVIEWER: Do you use any other tools except ICT mentioned in (11) above?**

B37: *INTERVIEWEE: No, no, no.*

B38: INTERVIEWER: Who supplies you with all the tools you mentioned above?

B39: *INTERVIEWEE: The school supplies us we make a list of things we need, they buy they bought for us.*

B40: INTERVIEWER: Did you receive any form of training / workshop on how to use these supplied tools you mentioned when you teach visually impaired learners?

B41: *INTERVIEWEE: No*

B42: INTERVIEWER: So you teach yourself?

B43: *INTERVIEWEE: Yes, I teach them, I also learn, I teach myself.*

B44: INTERVIEWER: As an educator for visually impaired learners, what do you think you could do for betterment of education for the visually impaired learners?

B45: *INTERVIEWEE: I think the people from the department they should always consider the visually impaired learners especially when this thing of annual assessment. They just write everything, they forget that these learners they can see. You find some questions are not suitable for the blind learners.*

So its problem. I think they should know when they prepare something, they should always think of the blind learners.

B46: INTERVIEWER: I appreciate it very much, thank you.

B47: *INTERVIEWEE: Thank you.*

INTERVIEW C

C1: INTERVIEWER: Good Afternoon Mom

C2: *INTERVIEWEE: Good Afternoon.*

C3: INTERVIEWER: In your view, what do you understand by Inclusive Education?

C4: INTERVIEWEE: ahh Inclusive education means when all learners, including learners with barriers to learning, are all taught at the same time, given the same opportunities and included in the classroom setting all of them. And, okay, addressing all the barriers to learning.

C5: INTERVIEWER: How relevant do you think is Inclusive education to the visual impaired learners?

C6: *INTERVIEWEE: Is very much relevant because most ehh visually impaired learners are excluded and treated separately and not included with the mainstream children. Now in an inclusive setting, we find that learners eeh, visually impaired or all the learners are included and treated the same time and taught at the same setting, and not being treated separately. And their barriers are addressed in the classroom setting.*

C7: INTERVIEWER: Do you mean they are taught the same curriculum with the learners who are not visually impaired?

C8: *INTERVIEWEE: They are taught the same curriculum; the only difference is that their barriers are being addressed there in the same classroom.*

C9: INTERVIEWER: How would you describe barriers to learning?

C10: *INTERVIEWEE: Barriers to learning are all the things that impede learning in a child. We have barriers like all the disabilities. We have barriers like a learning disabilities, mental disabilities, intellectual disability and all the other visual problems that the children will have. Ja, those are the barriers to learning.*

C11: INTERVIEWER: What type of barriers to learning do you think learners with visual impairments experience?

C12: *INTERVIEWEE: Children with visual impairments experience several barriers because most of the books which are printed by the printers, they are written in a small print. Most of the books have pictures and the pictures are cluttered. They have too much information, they are not too clear. Learners who are visually impaired again, eeh, their teaching material is very expensive and the totally blind learners also their material is expensive and they cannot be accommodated.*

C13: INTERVIEWER: Have you received any training with regard to identifying, assessing and supporting different barriers to learning that the visual impaired experience?

C14: *INTERVIEWEE: The training that we have received is the training which was organized by not by the district, but by the school and the National Council for the Blind.*

C15: INTERVIEWER: Could you indicate what the training entailed?

INTERVIEWEE: We were trained on low vision; so that children can be, we can help children who have low vision…we were trained in orientation and mobility. We were trained on skills for daily living.

C16: INTERVIEWER: How would you describe your skills regarding the above mentioned training?

C17: *INTERVIEWEE: Because I have been long in the school I would say some of the skills I was able to develop them myself. But when it comes to training, I think I still need more training.*

C18: INTERVIEWER: Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

C18: *INTERVIEWEE: Ehh with myself I did Further Education and Training with UNISA on visual disability.*

C19: INTERVIEWER: Did you receive any training / workshop about Inclusive Education? What type of training did you receive?

C20: *INTERVIEWEE: Yes I did receive workshop about inclusive education with the department of education.*

C22: INTERVIEWER: What training did you receive?

C23: *INTERVIEWEE: It was a week training where they identifying a different barriers to learning, addressing different barriers to learning and how a teacher should organize themselves if they are having learners with barriers in class.*

C24: INTERVIEWER: What type of problems do you sometimes encounter when you teach visually impaired children?

C25: *INTERVIEWEE: I encounter problems in that our school, all the visually impairment, the partially sighted learners and the blind learners are in one class. So the problems that we encountered is that we are not able to give individual attention to all of them because they are not separated. And another thing like I say is material because material for the blind and the partially sighted children is very expensive.*

C26: INTERVIEWER: Which Information Communication Technology (ICT) tools do you use when you teach visually impaired learners?

C27: *INTERVIEWEE: As it is now, we don't have any eeh with the Foundation phase we don't use any computer lab to teach these children. So most of the time, when we use computers, is when we make our own material.*

C28: INTERVIEWER: Do you use any other tools except ICT mentioned in (11) above?

C29: *INTERVIEWEE: No I don't think so may be eeeh (laughing) I am not computer technically inclined.*

C30: INTERVIEWER: Ok now, who supplies you with all the tools you for teaching?

C31: *INTERVIEWEE: Which tools like eeeh…?*

C32: INTERVIEWER: The tools I see in the classroom here. The charts?

C33: *INTERVIEWEE: The school because we have the budget, the school buys all that we need, so that we are able to teach the children.*

C34: INTERVIEWER: Did you receive any form of training / workshop on how to use these supplied tools you mentioned when you teach visually impaired learners?

C35: *INTERVIEWEE: No, we are not getting any training with the LTSM. No training at all.*

C36: INTERVIEWER: As an educator for visually impaired learners, what do you think you could do for betterment of education for the visually impaired learners?

C37: *INTERVIEWEE: I think is about empowering yourself by studying further so that you will be able to address all the problems you encounter and know all the eye problems and how to address them. and I think again we can also ask the department of education also to provide training for us instead of us going to institutions they must also workshop us on all these things so that we must also be on par with other people in the mainstream.*

C37: INTERVIEWEE: Thank you very much, I enjoyed the interview.

INTERVIEWEE: Thank you.

INTERVIEW D

D1: INTERVIEWER: Good Afternoon Mom

D*2: INTERVIEWEE: Good Afternoon Sir.*

D3: INTERVIEWER: In your view, what do you understand by Inclusive Education?

D*4: INTERVIEWEE: Hmmm, Inclusive education its whereby all learners who have learning special educational needs have to be combined in one education system, so that they all receive fair equal teaching and learning, that is my understanding.*

D5: INTERVIEWER: How relevant do you think is Inclusive education to the visual impaired?

D*6: INTERVIEWEE: Ehh, it is a little bit difficult neh, especially when it comes to the visually impaired learners because if you are to include them in an the inclusive set up, remember if there are different eh learning disabilities the visually impaired need special attention, like you have to teach them one by one, and then most of the time, remember they rely on listening more than seeing. So whatever you are write on the board, you must consider the visually impaired, of which will have to prepare work like Braille and whatever and whatever that you write on the board, you must also make sure that you explain to the visually impaired so its like doing double job at most of the time.*

D7: INTERVIEWER: How would you describe barriers to learning?

INTERVIEWEE: Eeh barriers to learning are those problems (learners) encountered by learners manifested by the learner during teaching and learning. You find that the child

has a got a problem with language development, he doesn't understand what you are saying if you are using English, and he is either a Sotho, speaker or Zulu, and then whatever you try to communicate he / she doesn't understand, you find out that child encounters problems in carrying out instructions and then even on carrying day to day work in class.

D8: INTERVIEWER: What type of barriers to learning do you think learners with visual impairments experience?

INTERVIEWEE: Mostly, especially the foundation phase ones. If I could start with the Grade R, remember these kids have never been to any creche' or nursery school. So their sensory development is not well developed and that sensory development has to help them read the Braille. So if it is not developed at the time when they go to school, you find that the child will experience problems. Another type of barrier to learning that the visually impaired learner encounters is the language. Most of the times these kids when they are at home, they understand the language that the adults. So because they are not included when children of their age are playing neh you find that they talk the language that the adults talk. So they are not well developed in the language that a child must go through during their stages of development. Those are the main ones.

D9: INTERVIEWER: Have you received any training with regards to identifying, assessing and supporting different barriers to learning that the visual impaired experience?

D*10: INTERVIEWEE: No I didn't, but when I was studying a B.Ed (Hon), I was doing inclusive education at the time, we talked about the visually impairments, even other learning barriers.*

D11: INTERVIEWER: As you have said, the training entailed the…?

INTERVIEWEE: It entailed the different learning barriers, that are manifested by, I think we were dealing with visual impairment, the ADHD learners, and which learners, I cannot remember the others. Ja, the physically impaired learners as well.Ja.

D12: INTERVIEWER: Thank you, how would you describe your skills regarding the above mentioned training? Are you well skilled now?

D13: INTERVIEWEE: I don't think that I am well skilled I still need more training because every time when you go through this journey, you encounter different problems every time.

D14: INTERVIEWER: Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

D15: INTERVIEWEE: Hmm, I don't have formal qualifications, I only did remedial education, and I also have Junior Primary Teachers Diploma, and I also have the B.Ed (Hon) inclusive education.

D16: INTERVIEWER: Did you receive any training / workshop about Inclusive Education? What type of training did you receive?

D17: INTERVIEWEE: Yes.

D18: INTERVIEWER: What workshop?

D19: INTERVIEWEE: It was organized by the Department of Education when they introduced the inclusive education, I don't know, how many years ago, about ten years.

D20: INTERVIEWER: What type of problems do you sometimes encounter when you teach visually impaired children?

D21: *INTERVIEWEE: Ehh the problem that we encounter when teaching the visually impaired learners, especially when coming to books, if the books have got lot of pictures and you want a child to analyze the picture, that one is definite problem. First you have to give the children the information about the picture so that they can analyze themselves in their mind. But it is so difficult with pictures. That's nothing you can do.*

D22: INTERVIEWER: Which Information Communication Technology (ICT) tools do you use when you teach visually impaired learners?

D23: INTERVIEWEE: Hey, we use nothing, the only thing that we have is the Braille machine, an then the computer that we have here, they are not even suitable for the kids because they don't have the JAWS and the DARKBERRY that the learners use.

D24: INTERVIEWER: You say the what?

INTERVIEWEE: DARKBERRY, yes it is a software for the blinds. It converts standard print to Braille.

D25: INTERVIEWER: Do you use any other tools except ICT mentioned in (11) above?

D26: INTERVIEWEE: Nothing, we don't use any other thing except the Braille machines.

D27: INTERVIEWER: Who supplies you with all the tools you mentioned above?

D28: INTERVIEWEE: We buy them at the South African Council for the Blind in Pretoria.

D29: INTERVIEWER: Did you receive any form of training / workshop on how to use these supplied tools you mentioned when you teach visually impaired learners?

D30: INTERVIEWEE: Yes we do.

D31: INTERVIEWER: For how long?

D32: INTERVIEWER: We have a teacher here at the school who was trained before, so every time when the new teacher arrive, they will teach us how to use those new tools.

D33: INTERVIEWER: How long does the training takes?

D34: INTERVIEWEE: It takes about a week. It depends on the individual how fast they catch.

D35: INTERVIEWER: As an educator for visually impaired learners, what do you think you could do for betterment of education for the visually impaired learners?

D36: INTERVIEWEE: Huuu, that one I can say a lot (laughs). If only they can revise the curriculum to suite the blind learners, definitely they would have done their job, because the curriculum as it stands it doesn't suit any visually impaired learner at all.

D37: INTERVIEWER: Can you give me examples of changes you will like to see in the curriculum?

D38: INTERVIEWEE: Looking at the assessment standards, they they put that the child should do at the end of the lesson. Most of them they involve visual children, children to have visual acuity so if children don't have any visual there is nothing they can see. They also want children to look at the pictures, draw this, do that, with the blind child, there is nothing that the blind child can do.

D39: INTERVIEWER: Thank you very much for the information you gave me.

D40: INTERVIEWEE: Thank you Sir.

INTERVIEW E

E1: INTERVIEWER: Good Afternoon Sir

E2: INTERVIEWEE: Good Afternoon to you.

E3: INTERVIEWER: In your view, what do you understand by Inclusive Education?

E4: INTERVIEWEE: Inclusion education refers to eh like integrating eh learners with impairments and learners who do not have any type of eh impairment.

E5: INTERVIEWER: How relevant do you think is Inclusive education to the visually impaired learners?

E6: INTERVIEWEE: I think is very much relevant, eeh as visually impaired people we need people who are not visually impaired we need them for ee example for how can I put it? Eeh they help us in our home works, class works and other works. Yes they help us. They read out materials for us.

E7: INTERVIEWER: Ok. How would you describe barriers to learning?

E8: INTERVIEWEE: For an example, as a visually impaired person sometimes we don't have enough, I mean eeh Braille materials that I can read, and most of the materials are in print, and we cannot, we don't have access to them.

E9: INTERVIEWER: So what is a barrier?

E10: INTERVIEWEE: A barrier is that we cannot read this ordinary print.

E11: INTERVIEWER: Ok. What type of barriers to learning do you think learners with visual impairment experience?

E12: INTERVIEWEE: Like for an example, the first one is that learners cannot access what this eeh print material, and a as result to them is a barriers, especially the lower classes learners who cannot voice out their concerns. That is a serious problem. But to a especially learners who are in tertiary institution they have opportunity maybe to form friendship with other students, they can, who can help them out, eeeh by reading out materials for them.

E13: INTERVIEWER: As a blind or semi blind educator have you received any training with regards to identifying, assessing and supporting different barriers to learning that the visual impaired experience?

E14: INTERVIEWEE: No, no

E15: INTERVIEWER: Then how do you teach these learners?

E16: INTERVIEWEE: Ja, I mean as a blind person myself eeh I just think I understand them because I have been eeh partially sighted for , I've been to a special school ever since from Grade one until I pass Matric, from there I went to tertiary institution and I think I know and I understand my problems.

E17: INTERVIEWER: So you didn't receive any formal training?

E18: INTERVIEWEE: Formal training in?

E19: INTERVIEWER: in teaching visually impaired learners?

E20: INTERVIEWEE: Not teaching visually impaired learners, but teaching, I have formal training in teaching, but not teaching visually impaired learners.

E21: INTERVIEWER: How would you describe your skills regarding the above mentioned training? Are you well skilled?

E22: INTERVIEWEE: I think I am okay because I must say the school that I attended for the blind was very good. And I think I have acquired all the skills, and I think those skills are helping me to cope or to can manage better in my classes.

E23: INTERVIEWER: Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

E24: INTERVIEWEE: I have B.A and H.E.D. from the University of the North.

E25: INTERVIEWER: Did you receive any training / workshop about Inclusive Education? What type of training did you receive?

E26: INTERVIEWEE: Yes, I did, I think it was 2008, we attended a workshop which was organized by the Department of Education somewhere in Boksburg. Beachwood Hotel.

E27: INTERVIEWER: Where?

E28: INTERVIEWEE: Beachwood Hotel.

E29: INTERVIEWER: What were you trained on?

E30: INTERVIEWEE: Yes, although it was to me, it was something I knew it was just a revision. We were just told how to deal with visually impaired persons. How to identify a visually impaired person cause in other schools, you may find that there are people who are visually impaired, who is not even aware of his state of health, and we were told how to identify these people , and how to deal with that person, where to refer that person if you cannot help them.

E31: INTERVIEWER: What type of problems do you sometimes encounter when you teach visually impaired children?

E32: INTERVIEWEE: Problems that we encounter? It's like for now, I think this a problem, especially when it comes to reading neh. Reading is a problem, although I know even in mainstream schools, they experience reading problems. But to blind learners, is such a big problems because I said earlier on they don't have enough materials Braille books that they can read on. Now this is a serious problem. They cannot, they are not used to writing, so mostly they depend on us to read out materials for them.

E33: INTERVIEWER: Which Information Communication Technology (ICT) tools do you use when you teach visually impaired learners?

E34: INTERVIEWEE: Eeeh, personally I was not trained to maybe to use a computer and that is why we have eh assistance, we have assistant teachers in our classrooms, as visually impaired teachers. So when for an example, I want to write something to write notes for those partially sighted learners on the chalkboard, the assistant will help me out and when I want to do some class work, they will write it down. We have a person who will write that in computer, who will Braille that one for the learners.

E35: INTERVIEWER: Do you use any other tools except ICT mentioned in (11) above?

E36: INTERVIEWEE: No

E37: INTERVIEWER: Who supplies you the tools you use to teach learners above?

E38: INTERVIEWEE: The school, like the department.

E39: INTERVIEWER: Did you receive any form of training / workshop on how to use these supplied tools you mentioned when you teach visually impaired learners?

E40: INTERVIEWEE: In fact we are supposed to receive them, but eh we do have a computer lab here, we were told that we will get training, but we don't get that training.

E41: INTERVIEWER: You have not received it yet?

E42: INTERVIEWEE: Yes not yet.

E43: INTERVIEWER: As an educator for visually impaired learners, what do you think you could do for betterment of education for the visually impaired learners?

E44: INTERVIEWEE: I think the most important thing that we need to do now is to conscientice maybe the department, the parents, and the community at large about blindness. And if all these people understands all about what blindness is all about, and the difficulties that these people face eh in order to eh in their studies, then I think half of the battle would have been won. Eh for an example, eh the department, they don't really understand the real problems that blind learners experience. You understand, like the department they only understand something from, they just read things from a book but they have first hand experience, so if they can have first hand experience. If they can, maybe consult with, consult directly with teachers who teach these blind learners, I think they will get more information and they can help these visually impaired learners better.

E45: INTERVIEWER: Thank you Sir, I enjoyed the interview.

INTERVIEWEE: Thank you, my pleasure.

INTERVIEW F

F1: INTERVIEWER: Good Afternoon

F2: INTERVIEWEE: Good Afternoon.

F3: INTERVIEWER: In your view, what do you understand by Inclusive Education?

F4: INTERVIEWEE: Hmm, inclusion education is the education for all, including learners will all disabilities.

F5: INTERVIEWER: Can you give me an example of a disability?

F6: INTERVIEWEE: Like visually impairment.

F7: INTERVIEWER: How relevant do you think is Inclusive education to the visual impaired?

F8: INTERVIEWEE: Ehhh, it can be relevant, it cannot be relevant sometimes. It is relevant in the eh sense that the learners will be incorporated in the community. They will

be included – they be inclusive with other learners with whether they are normal, they've got other impairments.

F9: INTERVIEWER: Now can you explain to me why do you say it can be irrelevant.

F10: INTERVIEWEE: It can be irrelevant in such a way if there are not educators who are equipped to work with learners with special needs. Then it won't work.

F12: INTERVIEWER: How would you describe barriers to learning?

F13: INTERVIEWEE: Barriers to learning are like eh what obstacles neh that are that impair learners to achieve and shift to the maximum of their abilities.

F14: INTERVIEWER: What type of barriers to learning do you think learners with visual impairments experience?

F15: INTERVIEWEE: Eh, number one is visually impairments, with the fact that they can't see, so whatever we teach them, we have to adapt them, to bring it to their level of not understanding but to their visual impairment. Things like font or making Braille copies.

F16: INTERVIEWER: Have you received any training with regards to identifying, assessing and supporting different barriers to learning that the visual impaired experience?

F16: INTERVIEWEE: Yes I have with UNISA.

F17: INTERVIEWER: What type of training?

F18: INTERVIEWEE: Advanced Certificate in Special needs with visual impairments.

F19: INTERVIEWER: So it means you were trained on how to teach learners who are blind?

F20: INTERVIEWEE: Yebo (yes) theory and practical!

F21: INTERVIEWER: How would you describe your skills regarding the above mentioned training?

F22: INTERVIEWEE: Yebo I am (laughs), I can design my own work sheets.

F23: INTERVIEWER: Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

F24: INTERVIEWEE: I've got advanced certificate in special needs with visual impairments

F25: INTERVIEWER: Did you receive any training / workshop about Inclusive Education? What type of training did you receive?

F26: INTERVIEWEE: It was part of my studies, inclusive education. You referred eh, hm, eh what is that? Paper 6.

F27: INTERVIEWER: White Paper 6.

F28: INTERVIEWEE: Yes.

F29: INTERVIEWER: Who trained you?

F30: INTERVIEWEE: At UNISA!

F31: INTERVIEWER: What type of problems do you sometimes encounter when you teach visually impaired children?

F32: INTERVIEWEE: Eeh basically it's a material, eh enlarged material and Braille material.

F33: INTERVIEWER: So you don't receive this kind of material?

INTERVIEWEE: Yes we have to do it ourselves here at school.

F34: INTERVIEWER: Which Information Communication Technology (ICT) tools do you use when you teach visually impaired learners?

F36: INTERVIEWEE: Me (laughing) I don't use it, like directly in class, but to prepare their work sheet, obviously we use a computer, then we have to print them, and then we have to Braille them, change the format from Microsoft to Darks berry

F35: INTERVIEWER: Do you use any other tools except ICT mentioned in (11) above?

F36: INTERVIEWEE: Yes, I think yes, we adapt a lot, I don't know what do we call this machine, but you write on the Braille machine, then you put on this big machine neh… its like embosses neh so that you don't loose the information.

F37: INTERVIEWER: Who supplies you with all the tools you mentioned above?

F38: INTERVIEWEE: Ahh, most for our school mostly we get donations is basically donations.

F39: INTERVIEWER: Did you receive any form of training / workshop on how to use these supplied tools you mentioned when you teach visually impaired learners?

F40: INTERVIEWEE: No no only few teachers who work directly with those eeh those tools.

F41: INTERVIEWER: As an educator for visually impaired learners, what do you think you could do for betterment of education for the visually impaired learners?

F42: INTERVIEWEE: Yes (laughs)

F43: INTERVIEWER: Just two statements

F44: INTERVIEWEE: Number one, to get books, text books, neh text books which are printed in large font neh! To also get readily available Braille books neh. Yes that would help a lot.

F45: INTERVIEWER: Thank you very much Mom.

F46: INTERVIEWEE: Thanks Sir.

INTERVIEW G

G1: INTERVIEWER: Good afternoon ladies and a gentleman.

G2: INTERVIEWEE: Good afternoon Sir,

G3: INTERVIEWER: In your view, what do you understand by Inclusive Education?

G4: INTERVIEWEE (3): Eehh, my understanding of Inclusive education simple means, a number of learners, with different , varying abilities, maybe some blind, some partially sighted, some physically challenged, where they are actually being taught together. That's the inclusive education, my understanding of inclusive education.

G4: INTERVIEWER: Is there anybody who wants to say anything about in inclusive education?

G5: INTERVIEWEE (1): I think he said it all.

G6: INTERVIEWER: thank you. How relevant do you think is Inclusive education to the visual impaired?

G7: INTERVIEWEE (5): Eeeh, at some point, is not practical, because we are lacking the materials and the other learners and the other learners and some teachers are unable to read and write Braille. So according to me, its not like, it not gonna be a practical as possible.

G8: INTERVIEWER: Can you give me an example of materials you are speaking about?

G9: INTERVIEWEE (4): Braille machines.

G10: INTERVIEWER: Anybody who wants to say something?

G11: INTERVIEWEE (3): I've got a bit of different view that inclusion, in fact it is important in the sense that developing learners for the world where people are living together with no abled and challenged individuals. they must grow together, they must develop together. But in practise, it's a bit of a challenge. Its cost, that is actually, the costs, it's too expensive to actually manage them. At the present moment, maybe it can be done up to a certain extend. Not in totality, because you've got a rare cases where some cases are very difficult to manage.

G12: INTERVIEWER: Thank you very much interviewee no 3. How would you describe barriers to learning?

G13: INTERVIEWEE (2): I can describe barrier to learning, maybe I can say due disability because may be if you lack some material maybe to support that child. It can be a barrier.

G14: INTERVIEWER: Thank you. Can you give me another type of a barrier?

INTERVIEWEE (3): eeh I will think of eeeh the lack of material and also the lack the knowledge of mediator himself or herself in actual departing the knowledge to the learner.

G15: INTERVIEWER: Okay interviewee 1?

G16: INTERVIEWEE (1): Also I think another barrier is that they are not given enough time. Our learners are not given enough time like learners from other school because of the disability so that can be also a barrier.

G17: INTERVIEWEE (3): The other barrier it's mainly the policy itself and the methodology that is being implemented. The people who advocate, their need, they are not considering the fact that we've got special learners with special needs which is not catered for. Imagine some many materials we've got pictures and stuff which not catered accessible to blind or challenged individuals.

G18: INTERVIEWER: What type of barriers to learning do you think learners with visual impairments experience?

G19: INTERVIEWER: Thank you.

G20: INTERVIEWEE (4): Lack of materials.

G21: INTERVIEWER: Like what?

G22: INTERVIEWEE (4): Like the books, like the Braille, they don't have enough books.

G23: INTERVIEWER: Okay what else?

INTERVIEWEE (3): The Braille machines, the technology that is being used, upgrading and, its cost, it's too expensive. So it is the biggest barrier to them. Imagine all the school, you'll find that the library is the biggest problem, public library, in accessing information, it is difficult to them.

G24: INTERVIEWER: Anything interviewee 4?

G25: INTERVIEWEE (4): Anything that the mainstream children can use the blind cannot be able to use.

G26: INTERVIEWEE (3): I may also think of the other barrier that hmm what practically, there is learning by observation. You learn a lot outside a class, and that's not possible with the blind child. It's a challenge.

G27: INTERVIEWER: Thank you. Have you received any training with regards to identifying, assessing and supporting different barriers to learning that the visual impaired experience?

G28: INTERVIEWEE (1): I did receive any training but they are not implementing whatever that they spoke about it.

G29: INTERVIEWER: Could you indicate what the training entailed?

G30: INTERVIEWEE (1): I received training; it was for four days, the barrier in visual impairment.

G31: INTERVIEWER: Okay, anybody who received training?

G32: INTERVIEWEE (3): Ja, I have received a number of training that actually aimed at assist ehh learners with visual challenges, ehh but by other bodies that deals with visual impaired learners.

G33: INTERVIEWER: Did you receive any training Mom? (asking interviewee. 5).

G34: INTERVIEWEE (5): No, I did not.

G35: INTERVIEWER: You Mom? (asking interviewee. 2).

G36: INTERVIEWEE (2): No.

G37: INTERVIEWEE (1): I have received sign language training.

G38: INTERVIEWER: Who trained you on sign language?

G39: INTERVIEWEE (1): They trained me here at school, my HOD.

G40: INTERVIEWER: How would you describe your skills regarding the above mentioned training?

G41: INTERVIEWEE (1): I am not skilled.

G42: INTERVIEWER: What do you want us to do to skill you in that training?

G43: INTERVIEWEE (1): I think you can spend more time on that because if you, like a training of four days it is not enough so that you can practically do it.

G44: INTERVIEWER: Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

G45: INTERVIEWEE (3): Firstly, I've done Braille (TOT), Training of Trainers. I've got certificate on that one by one of the colleges. It allows me and capacitate me to teach blind learners. I also went for a B.A (ED) degree, and Honors degree, among the courses, the modules I was doing one had to learn a special bit if ehh learners with special needs. So that equipped me a lot, and also I've done adaptive course , that actually addresses barriers to learning when it coming to visually challenged individuals.

G46: INTERVIEWER: That was interviewee no 3. Interviewee no 1 did you have any formal qualifications?

INTERVIEWEE (1): No, I don't have, but here at school, once a week if I am not mistaken, we are having workshops which are conducted by Mr. Chikalange. That's the only training that I have as far as visually impaired kids are concerned.

G47: INTERVIEWER: Interviewee no 2 any qualifications?

G48: INTERVIEWEE (2): No, I don't have any qualifications concerning to teach the visually impaired learners.

G49: INTERVIEWER: Interviewee no 4?

G50: INTERVIEWEE (2): I also don't have any qualifications.

G51: INTERVIEWER: Did you receive any training / workshop about Inclusive Education? What type of training did you receive?

G52: INTERVIEWEE (1): No, I didn't.

G53: INTERVIEWEE (2): No.

G54: INTERVIEWEE (3): I've attended a number of sessions that deal with inclusion. Some were offered by Department of Education. Sometimes, and

also the workshop that deals with White Paper 6 which talks a lot about inclusion.

G55: INTERVIEWER: What type of problems do you sometimes encounter when you teach visually impaired children?

G56: INTERVIEWEE (3): The biggest problem I've noticed the learner the visually impaired learner one senses is not there there is a lack of early childhood stimulation, which is learner readiness. The majority of them, you'll find they are not ready because they never attended pre schools, preparatory classes at their early age. That's the biggest trouble. It affects their cognitive development at younger stage, and it later affects them when you teach them.

G57: INTERVIEWER: Which Information Communication Technology (ICT) tools do you use when you teach visually impaired learners?

G58: INTERVIEWEE (3): We are using computers, with talking software which is designed to help blind learners to access information to understand, which is very important. We are also using the software, the printers, the electronic that convert the information to Braille which is their format.

G59: INTERVIEWER: Do you use any other tools except ICT mentioned in (11) above?

G60: INTERVIEWEE (1): We've got the number if Braille packing machines. We also using some stencil that they can write their own hands.

G61: INTERVIEWER: Thank you. Who supplies you with all the tools you mentioned above?

G62: INTERVIEWEE (3): At the moment, we got the National Council for the Blinds, that is supplying some of that tools, those tools. Again we've got tools suppliers sensory solutions and Neville Technologies that is supplying that.

G63: INTERVIEWER: Did you receive any form of training / workshop on how to use these supplied tools you mentioned when you teach visually impaired learners?

G64: INTERVIEWEE (3): I've received some of the training and I am trained on different places. The very people who are offering the tools. They train.

G65: INTERVIEWER: As an educator for visually impaired learners, what do you think you could do for betterment of education for the visually impaired learners?

G66: INTERVIEWEE (3): I think they need to be taught how to use computers, as a tool or aid for learning itself and also the library, because the library is there for them.

G67: INTERVIEWER: Thank you very much; I've enjoyed the interview ladies and gentlemen.

G68: INTERVIEWEES: Thanks very much.

INTERVIEW H

H1: INTERVIEWER: Good Morning.

H2: INTERVIEWEE: Morning

H3: INTERVIEWER: In your view, what do you understand by Inclusive Education?

H4: INTERVIEWEE: Inclusion education is where they try to facilitate the disabled in mainstream schools

H5: INTERVIEWER: How relevant do you think is Inclusive education to the visual impaired?

H6: INTERVIEWEE: It all depends on in which country you're talking about. In the first world countries they did a lot to enable the kids to be facilitated in mainstream. I had the opportunity to went to Australia about six years ago, and ehh the Royal for the Blind there gets a lot of funding from the state. And it make it possible for them to ehh take a specific facilitator to a descent school and ask them what needs of a blind are in that school, and then they go back to head office, and they prepare the text and the notes and everything the children need to have ehh in Braille. They prepare for them and then they also send it back to them on weekly basis. Unfortunately in the third world country is not really viable. Ehh. So I would say, in this country I can really can't really see the role of LSEN schools and specials schools for the disabled because we don't have the funding to facilitate these things in the mainstream schools.

H7: INTERVIEWER: In a nutshell, what you are saying is that in South Africa we need a lot of funding to facilitate these types of schools?

H8: INTERVIEWEE: True, and then another thing, a lady there in Melbourne, to be more specific, she told me they try as far as possible to be as politically correct as possible but in practice, it doesn't really work.

H9: INTERVIEWER: How would you describe barriers to learning?

H10: INTERVIEWEE: ohh. That is hurdled like kids that cant see that struggle to get their text ready to or available for them maybe to learn for test or exams and it depends on the type of ehh disability ehh you can elaborate on that specific disabled kid. You know if it is for the deaf obviously he can't hear, they must resort to sign language. In our school ehh the kids resort to, you know, a huge big screen, monitored screens, and we've got cameras to enlarge text for them. And also for the blind, we've got text books that we ordered from Western Province, from Picket Pioneer school, as so we basically we need to have text books ready for the kids, to you know , to be able to ehh just want to see your question its got barriers to overcome these barriers. Ja.

H10: INTERVIEWER: What type of barriers to learning do you think learners with visual impairments experience?

H11: INTERVIEWEE: Ehh, there is a lot. I think time is one of our major concerns especially when it come to examinations, we need to give kids extra time because it is very time consuming especially for the kids to read through their Braille papers and they refer to sketches or graphs ehh or normally they have sketches and graphs separate to the paper and they must first ehh try to find text where they refer sketches. So it takes a long time for them ehh to get themselves orientated, you know, with a specific problem. So we need to ask for concessions from our district and from the National Department. You know, so we normally get a quarter of an extra time per hour, say for instance, we got three hour paper, then it would be, what is it now, you add quarter of an hour to half an hour so, they allow some concessions to the kids. Ehh , Ja, then availability of text ehh in our school we travel a lot especially now. When we have the outcomes based you know system, you know, we had to work from different sources, from different text books, and these were available at publishers but we first of all had to get a permission from publishers to copy those books or to reproduce it into Braille. So it is quite a struggle to get text ready for the Braille. We ehh ordered from the Pioneer school, but don't make use most of the recent text books. Se we had to work from different sources, and that's quite a struggle to get your notes compiled from all the different sources for the blind. And that's not readily available in the bookshop so we basically have to produce our own text.

H12: INTERVIEWER: Ok

H13: INTERVIEWEE: Ja

H14: INTERVIEWER: Have you received any training with regards to identifying, assessing and supporting different barriers to learning that the visual impaired experience?

H15: INTERVIEWEE: Everything that I know about the training for the blinds, and the visually impaired I basically taught myself. The school sent me two to three times to Pioneer school to see the way in which they teach the kids over there. I went to different ehh Braille, Braille SA meetings in the Western Cape, I try, you know, as far as possible to be in touch with the latest developments ehh especially now with the unified Braille or the changes, so we need to adapt to new changes and so forth.

H16: INTERVIEWER: In short you were trained quiet extensively on Braille?

H17: INTERVIEWEE: Yes, one has to know Braille properly in order to assist the kids. Its like spelling, you need to tell the kids where the make spelling you know spelling mistakes. So there is no need for you to give the kids a Braille paper and you can't read the paper. You should be able to know all the terminology Maths and Science and everything in order to assist the kids.

H18: INTERVIEWER: Could you indicate what the training entailed?

H19: INTERVIEWEE: I wouldn't say I am well skilled, but I am one of a very few people in the country that teach ehh Maths and Science in Braille and it is also a struggle new we a new unified Braille to get skilled people to come and teach us the correct way of this. We should I think, get someone out of the country, to come and assist us in doing so.

H20: INTERVIEWER: Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

H21: INTERVIEWEE: Ok, I got my teaching Diploma, I've got my B.Sc. degree in my different subjects, I teach Maths and Physical Science, I think I am well equipped in doing so but for eeh assisting the partially sighted and the blind kids, the things that I was taught, I did basically, you know through the school, and basically I read out on the way to assist the kids.

H22: **INTERVIEWER: Did you receive any training / workshop about Inclusive Education? What type of training did you receive?**

H23: INTERVIEWEE: Ehh,I am well aware of what Inclusive education is all about, but we didn't receive any formal training on that or haven't received any formal training on that.

H24: INTERVIEWER: What type of problems do you sometimes encounter when you teach visually impaired children?

H25: INTERVIEWEE: Ehh, as I said earlier on, time is a vital thing, you know, it would be actually interesting if you can ehh attend one of my classes because I basically need to convey knowledge twice. I must first pay attention to the partially sighted, I normally explain things to them underneath a camera, and I try to enlarge things for them, give them notes on the work that we are busy with, then I have to move over to the Braille kids and the approach is totally different from that of a partially sighted because that requires a lot of personal attention to a specific kid. And then see what he is writing down, and if it is correctly done. And with Science and Maths, You must know exactly the lay out of what Braille requires to a specific problem and so forth.

H26: INTERVIEWER: Which Information Communication Technology (ICT) tools do you use when you teach visually impaired learners?

H27: INTERVIEWEE: Ok, we make use of ehh you know, Closed Monitored Circuit Systems, the cameras to enlarge images for them on the screen and we also I make use of software program, I make use of ehh dual plug to get certain of a text translated into Braille. I make use of the tiger printer when I have to do diagrams and sketches ehh and you know for the blind in the specific frames and you know graphs for the blinds in the scientific frames and you know I also make use of scientific note books, in which I prepared Mathematical text for them and then it should be translated into Braille ,and I have to edit it before I can use normally of the Darks berry program to edit the text and then its basically embossed with the impact machine.

H28: INTERVIEWER: Do you use any other tools except ICT mentioned in (11) above?

H29: INTERVIEWEE: Sometimes you need to be very practical in the way you think when you teach certain concepts to children, for instance, the orientation of the of the kids, the spatial orientation, especially when they start of with the graphs. You know, their sense of direction. What I did was I made some boards , I will show you right now, a huge board with little holes that is filled

with pins, so that they can physically try to plot certain positions of the board, you know like mapping of some positions, so they can get aware of you know spatial orientation of graphs before I start off with that, I've got several of such examples.

H30: INTERVIEWER: Who supplies you with all the tools you mentioned above?

H31: INTERVIEWEE: Ag, its basically we budget through the school and most of the things that I order, ehh like the text books for the blinds eh its already budgeted for and for the special ehh normally we get donations. These boards were made by a parent you know, and they were donated to a school, and there are different ways in which we try to, eeh you know, fund raising in order to get all different printers and software programs. I might just add, it wasn't a walk in the park at all you know we had to specifically draw a geometry sketches and you know, make use of Perkins

Braille in order to get text ready for the kids, and the preparations for the blind kids, is very expensive, you know, is very time consuming, and we struggled a lot, and we had a lot of fund raising, and eeh things before we were not able to carry on like we do now, with all the cameras, and the monitors ,and your embosses software programs as is.

H32: INTERVIEWER: Earlier on you mentioned you teach yourself how to use these tools and the other tools?

H33: INTERVIEWEE: We got a company here that assist us in with you know, to install all this equipment in the school, and the specific irony of that company, they normally come to us and he will show us exactly how to make use of that specific apparatus

H34: INTERVIEWER: As an educator for visually impaired learners, what do you think you could do for betterment of education for the visually impaired learners?

H35: INTERVIEWEE: Ehh, well I think that, you know, communications is vital importance because I know of a lot of schools that aren't as privileged as we are right now, to have all these equipment in their classes, and I would say that the teachers involving, you know that are involved in the teaching of the blinds should come together on an annual or a day just to you know get informed on the latest so that they should know for instance how to make use of software

programs. Some schools got donations, they even have the tiger printers but they don't know how to use them. Teachers don't really know how to use them, these tools you know and I think these teachers should also you know try to ehh get better knowledge of Braille, they must also you know with the implementation of the new unified Braille, they should get acquainted with the way is written so that they can teach it to the kids

H36: INTERVIEWER: thank you very much Sir, I enjoyed the interview.

H37: INTERVIEWEE: Thanks

INTERVIEW 9

I1: INTERVIEWER: Good Morning Mom.

I2: INTERVIEWEE: Good Morning

I3: INTERVIEWER: In your view, what do you understand by Inclusive Education?

I4: INTERVIEWEE: By inclusive education I would say that that's the kind of education provided to learners regardless of their physical disabilities. In other words inclusive will mean learners with physical disabilities could be included in a mainstream.

I5: INTERVIEWER: How relevant do you think is Inclusive education to the visual impaired?

I6: INTERVIEWEE: This is just not a simple question to answer because it all depends on the ability of, for example the mainstream school to provide the visually impaired learner with language materials. I speak of language because I am a language teacher. In other words it will depend on their ability to provide the learner be it in with enlarged print materials and also question papers. And if they deal with the blind learner they have to provide a learner with all his learning materials in Braille. So it is not just an easy question, I think it depends on the acuity of the learner, the visual acuity.

I7: INTERVIEWER: How would you describe barriers to learning?

I8: INTERVIEWEE: I think barriers to learning will be something like the, I am speaking from the point of a visually impaired learners, the fact that the learner might be in a class where the tempo is different because you must remember that the visually impaired take longer to find a place for, example in a book than another learner because he had to find a place. It is not as easy like a

person who can see at first glance. And if it is a blind learner it takes even longer because the pages of a blind book and the sighted book also differ. And I would think that will be the kind of thing that I would see a barrier to learning. And when it also comes to the teaching of visual literacy. That is also a problem to a Braille learner. Certain question regarding visually literacy, things like emotions, like expression on a face. This would a barrier to a visually impaired learner if he can't see. So that would have to be described to them using language.

I9: INTERVIEWER: What type of barriers to learning do you think learners with visual impairments experience?

I10: INTERVIEWEE: Hmm, at our school? I would think, ehh, a barrier to learning will be, we try obviously to overcome all the barriers of learning at school. Hmm if I can give you one example, a barrier to learning would be if the teacher would not be able to provide a learner with, for example, literary text, we have certain prescribed work for learners in Grade 10, 11, 12. All these books are not available in Braille. So if I could not provide learners or if I can't provide learners with, let's take for an example, take a book like the 'Crucible', if I cannot provide that drama to that learner in Braille, that would be a barrier to learning because the learner needs the text book physically.

I11: INTERVIEWER: Have you received any training with regards to identifying, assessing and supporting different barriers to learning that the visual impaired experience?

I12: INTERVIEWEE: I think its In-Service Training. I come from the mainstream school. That's my background. I have not received any specific training other than the training I received at school. I did receive In-Service-Training. And I think it's a continual thing because if we buy new machinery or apparatus, the we are trained on the use of it.

I13: INTERVIEWER: So it means your are trained when you receive new materials at schools?

I14: INTERVIEWEE: Yes.

I15: INTERVIEWER: How would you describe your skills regarding the above mentioned training?

I16: INTERVIEWEE: I am well skilled, that is why I am a senior teacher, and that's why I am the Head of department. I can read Braille, obviously using my

eyes, it's not a tactile ability that I have, very few, I think there is one person that I know of, in South Africa , a sighted person , who could read Braille using her fingers. I read contracted Braille, which I have learned because I cannot mark my learner's work if I cannot read what they have written.

I17: INTERVIEWER: Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

I18: INTERVIEWEE: Regarding?

I19: INTERVIEWER: The teaching of visually impaired learners.

I20: INTERVIEWEE: No formal qualifications, No.

I21: INTERVIEWER: Did you receive any training / workshop about Inclusive Education? What type of training did you receive?

I22: INTERVIEWEE: No, but we do go to symposiums where we talk about inclusive education, so we are all familiar with the terminology, but eh, not really. We've got also learners going to other schools, mainstream schools, and the teachers will contact use. And we will serve as a kind of a resource centre where we will be able to train these teachers in helping them as to how to deal with visually impaired learners.

I23: INTERVIEWER: What type of problems do you sometimes encounter when you teach visually impaired children?

I24: INTERVIEWEE: Yes, certainly, where do I start (laughing)?

125: INTERVIEWER: just give me one or two

I26: INTERVIEWEE: Ok, I can mention once again the availability of text books. You know it is very difficult thing, your department prescribes books, these books are not available in Braille, and so it becomes the problem of a teacher to make that book available in Braille, and that's a time consuming, a lengthy process, because you have to have the book typed and I have to edit the book myself. So I read through the entire book, on the computer I sit there and edit it, so it is refutable for a Braille printer to print it. Then we have to print it. Then I send it to our printing works, where they bind the book, so off cause we have to get the publication rights first, so its a very time consuming process. I cannot for example take eh, a newspaper clipping this afternoon at home, regarding something relevant. Lets say the trial of Jackie Selebi, which is something today that people deal with. I cannot take it this afternoon, and make a photocopy and bring it to class tomorrow and hand it out to sixteen

learners, and say let's read this. You've to provide every learner with the relevant font, we start we do fonts from font 12, font 14, 16, 18, 22, 24. After 24 we help the learners because at that stage we feel the learner should start learning Braille, depending of cause on their prognosis.

I27: INTERVIEWER: Which Information Communication Technology (ICT) tools do you use when you teach visually impaired learners?

INTERVIEWEE: Ok I understand correctly now what you mean by that term. In class we have monitors, we have a flipper camera which is a device that enable you to put your book underneath the camera and then show it on the monitor in front of the learner, we share monitors, we don't have a monitor for every learner. Some of those learners who are alright just looking at the book, they can easily do that. It is especially helpful when you work with visual literacy; we a cartoons, or an advertisement.

I28: INTERVIEWER: Do you use any other tools except ICT mentioned in (11) above?

I29: INTERVIEWEE: I think a tool will probably include a computer. I have a computer. I have my own lap top, hmm; otherwise I will not be able to produce the learning materials. We also have Braille printers down stairs; we also have a cutting machine where we can cut the Braille so that it can be bound at the printing works.

I30: INTERVIEWER: Who supplies you with all the tools you mentioned above?

I31: INTERVIEWEE: First of all, most of the tools are provided through or are obtained through fund raising. The school raises funds and we buy these or donations.

I32: INTERVIEWER: Did you receive any form of training */* workshop on how to use these supplied tools you mentioned when you teach visually impaired learners?

I33: INTERVIEWEE: Yes, with all new apparatus, training is provided. So there is no teacher in this school who is not trained to use the apparatus that they need to provide hm teaching and learning material to students.

I34: INTERVIEWER: As an educator for visually impaired learners, what do you think you could do for betterment of education for the visually impaired learners?

I35: INTERVIEWEE: Hmm, well I am doing what I can, ehh is not much what I can do, but I think the department of education should take a look improving services for the visually impaired because I certainly do everything I can because I have to my learners with all the learning materials that they need . That is my responsibility. I have to see to it that they have exactly the same opportunities as any sighted learner in the mainstream school.

I36: INTERVIEWER: Thank you very much for the information you gave me Mom

I37: INTERVIEWEE: Thank you very much.

INTERVIEW 10

J1: INTERVIEWER: Good Morning

J2: *INTERVIEWEE: Good Morning*

J3: INTERVIEWER: In your view, what do you understand by Inclusive Education?

J4: INTERVIEWEE: The policy of inclusion education allows ehh mainstream schools to admit learners with disabilities. That's the policy of inclusion. But we try to eeh, add an additional service by providing education to educators of these learners. Hm to make the teachers of visually impaired learners in mainstream schools understand how they must adapt to provide services to learners in our school. So any schools is welcomed to make an appointment we us and then we train these educators. We give out like a short course in training to the teachers. To assist them on how to enlarge, what they must do and you must also remember that every child with visually impairment is different. When you have training for one child it doesn't mean its gonna be enough training for the next child because every child with an eye problem sees the world differently. Some children need darker stencil writers, other need thicker stencils. It depends on the child visually impairment and the eye disease. So one must look at that and understand that, and then you must make deductions.

J5: INTERVIEWER: How relevant do you think is Inclusive education to the visual impaired?

J6: INTERVIEWEE: It depends very much on the child, and on the teacher and the support services available. The support structures. If the parents and the teachers work hard together, they can, you can mainstream the visually impaired child, but it takes a lot of input from all the parties.

J7: INTERVIEWER: How would you describe barriers to learning?

INTERVIEWEE: Ok, any barrier to learning makes it difficult for the child to achieve the child's full potential. So a barrier to learning will hamper the child eh to achieve to a full potential. So it is the responsibility of the teacher to try and remove the barriers to learning so that the child can achieve optimally.

J8: INTERVIEWER: What type of barriers to learning do you think learners with visual impairments experience?

J9: INTERVIEWEE: Now, 80% of the information that you gather, ehh you derive from your visual sense. These children are denied that, they can only get information from the auditory sense, or their tactile sense. That makes it; it makes it difficult for them to know about their world that they live in. For example, they don't know about a tree, they can't see a tree; they can only feel the roughness of the branches, and the barks. But it's very difficult for them to visualize a tree and then in Grade 12, they must do a poem about a tree. So you the teacher must step by step explain what the tree looks like, eh it's difficult for them to imagine the what the spider, and the spider can be dangerous to touch. Ehh when it is dead and hhm it doesn't help to touch it because it's not really like a spider you see anymore. Its vocabulary is difficult for them to understand, because everything, tree spider everything must be explained. So, because vocabulary is different it hampers, ehh it can hamper their learning. ja.

J10: INTERVIEWER: Have you received any training with regards to identifying, assessing and supporting different barriers to learning that the visual impaired experience?

J11: INTERVIEWEE: Except for the training that I was offered at the then university, the other training I got at the school and the rest I read about and I taught myself.

J15: INTERVIEWER: Could you indicate what the training entailed?

J13: INTERVIEWEE: I did a lot of reading on, trying to understand on how children with different visual disabilities see the world differently. So I read a lot

about eye conditions, ehh I also studied a lot about hmm I've done my own reading how they, the way the parents of feel about the child's impairment. How that impact on the child. If the parents find it difficult to accept that their child has a visual impairment, then they subconsciously convey that to the child. And the child also find it difficult to make peace and to come to acceptance of their visual impairment. And when parents find it difficult to accept that their child's visual impairment. They done of two things, they either over protect the child and do everything for the child, and then we get a ten year old at the school who cannot dress himself, or herself, who cannot eat independently and that's not good, or you get a child is under protected by parents, rejected actually by the parents, and sent away and ehh lives ehh a separate life from the parents. Because every time the parents see this visually impaired they are reminded of the impairment. So some parents they do as little as possible. They budge.

J14: INTERVIEWER: How would you describe your skills regarding the above mentioned training?

J15: INTERVIEWEE: I have seven years of university training, and I also have 26, 27 years of experience at the school. So yes.

J16: INTERVIEWER: Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

J17: INTERVIEWEE: Okay, I first did my B.A. languages at then the University of RAU, now University of Johannesburg, and then I did my professional degrees at the University of Pretoria.

J18: INTERVIEWER: Did you receive any training / workshop about Inclusive Education? What type of training did you receive?

INTERVIEWEE: I did many courses, but I haven't done one in inclusive education.

J19: INTERVIEWER: What type of problems do you sometimes encounter when you teach visually impaired children?

J20: INTERVIEWEE: One of the big problem I encounter is that ehh the parents ehh, find it difficult to support the child with homework, and the projects. Hmm most of our parents live far away. They only see children on weekends, and there there is not always time to spend helping the children with school work. So whatever ehh the work we do with children we must do it

in class. Ehh we cannot always send a project home and expect it to come back. Not all children get the support from their parents.

J21: INTERVIEWER: Which Information Communication Technology (ICT) tools do you use when you teach visually impaired learners?

J22: INTERVIEWEE: I use the visual aids and as required for that specific child's disability or the work is enlarged or given in Braille. And then I use the blackboards, I always to bring ehh 3D, the real objects into the class. If we talk about a flower, then I bring the flower into the classroom. I take the children out into veld. I try to bring objects into the class. I adjust according to their age levels and to the specific disability of the child.

J23: INTERVIEWER: Do you use any other tools except ICT mentioned in (11) above?

J24: INTERVIEWEE: Yes, some visual aids are not computerized like ehh the magnifying glasses. Yes I do use other things as well.

J25: INTERVIEWER: Who supplies you with all the tools you mentioned above?

J26: INTERVIEWEE: some I get from the school, some the learners bring in the class and some I bring from home.

J27: INTERVIEWER: Did you receive any form of training / workshop on how to use these supplied tools you mentioned when you teach visually impaired learners?

J28: INTERVIEWEE: I haven't gone to a specific workshop, but I have asked around a lot, we support each other ehh, we did attend, we the school gave us the opportunity to go to a computer workshop but that's the only specific workshop I attended on computers. The rest we ask each other, we give each other advice.

J29: INTERVIEWER: As an educator for visually impaired learners, what do you think you could do for betterment of education for the visually impaired learners?

J30: INTERVIEWEE: What can I do? But I just think if teachers know exactly what they have to do, and education stays the same, they will be more positive. There will be more commitment, but I don't know if you agree with me. Things changes every few years

J31: INTERVIEWER: That's true!

J32: INTERVIEWEE: Every time teachers got to more workshops and they must catch up. And you see if we can just get to a stage where everybody knows what they must do and they do it. Any system will work if it outcomes based if it is this one. Any system will work.

INTERVIEW 11

K1: INTERVIEWER: Good afternoon, Mom

K2: INTERVIEWEE: Good Afternoon.

K3: INTERVIEWER: In your view, what do you understand by Inclusive Education?

K4: INTERVIEWEE: Inclusion education according to me ehh learners with disabilities, no matter what type of disability, ehh are included in the mainstream education. That's my understanding

K5: INTERVIEWER: How relevant do you think is Inclusive education to the visual impaired?

K6: INTERVIEWEE: I think its very irrelevant, apart from the fact that ehh mainstream schools do not have the necessary facilities, its real that they don't have time, because of the work that they've got. It would be ideal, theoretically ideal, sound. But practically it's not possible.

K7: INTERVIEWER: How would you describe barriers to learning?

INTERVIEWEE: Barriers to learning is anything that makes it very difficult for you. I am not talking about barrier of ehh maybe ignoring objects or ignoring the fact that you need to study but the barrier to me its physical ehh sometimes mentally. I think physical disability is that prevention from learning in a way that is best for you.

K8: INTERVIEWER: What type of barriers to learning do you think learners with visual impairments experience?

K9: INTERVIEWEE: I cannot give any example or opinion, really regarding other subject. So as far as computer studies are concerned the fact is that they are troubled to see what is happening on the screen ,and I think that your far sighted are at the disadvantage ehh to the Braille, the blindness tool, because the Braille is specific an exact medium for partially sighted depending on how far the eye sight is, but the poor the eye sight the more difficult it is to get an

ehh overall impression if what should be done especially if they have to make some copies of and some to paste.

K10: INTERVIEWER: Have you received any training with regards to identifying, assessing and supporting different barriers to learning that the visual impaired experience?

K11: INTERVIEWEE: The only training I do have was from the Psychologist and the Occupational therapist eeh when I stared here, ehh where they explained the different barriers, and ehh where they try to give us guidelines ehh of how to approach these learners. But I would ehh of say 99% depends on yourself. You need to learn as you carry on. You need to swim, to jump into the big pot and you have to swim and you learn everyday

K12: INTERVIEWER: That means in most of these things you trained yourself?

K13: INTERVIEWEE: You train yourself; you do all ehh a lot of things you also pick from learners.

K14: INTERVIEWER: How would you describe your skills regarding the above mentioned training?

K15: INTERVIEWEE: I would like to think that at the moment if I can put it right, I am doing right because if I look at the past exercises, you know, sorry to interrupt myself, but we have to produce the stuff of all what are do for our self. But, if I look at my first exercises and exams that I have put together, papers and, if I look at the second and third, I can see progression within myself. So I think I am good. But you never stop learning. You always have to correlate with the learners.

K16: INTERVIEWER: Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

K17: INTERVIEWEE: No, as far as the visually impaired specifically is concerned, no formal training because we have ehh approached several specific institutions and reputable institutions and we have preferred specifically visually impaired, specifically.

K18: INTERVIEWER: Did you receive any training / workshop about Inclusive Education? What type of training did you receive?

K19: INTERVIEWEE: Yes, we did, yes. I cannot remember the year, yes I have.

K20: INTERVIEWER: What type of problems do you sometimes encounter when you teach visually impaired children?

K21: INTERVIEWEE: Hm, frustrations that you share with the learners, especially because can't see. Ehh when it comes to information technology, once again, because we use different programs, JAWS, JAWS which we turn to the Braille, the talking program. Ehh the other is the machine that enlarges the image, and some sound system, especially with Grade 11 for when they do integration of programs, it slows down the network in such a way that it takes them ten times longer to do it.

K22: INTERVIEWER: Which Information Communication Technology (ICT) tools do you use when you teach visually impaired learners?

K23: INTERVIEWEE: Ehh, we use specifically with visually impaired it's the MAGIC and JAWS and the additional office suit.

K24: INTERVIEWER: Do you use any other tools except ICT mentioned in (11) above?

K25: INTERVIEWEE: Not in my class. No. like the Television sets.

K26: INTERVIEWER: Who supplies you with all the tools you mentioned above?

K27: INTERVIEWEE: But you see, the Department of Education has to, but we always don't get what we need, but donations, we really get a lot of donations. The flat screens that you see here, they were donated by some company due to one of the learners who started here.

K28: INTERVIEWER: Did you receive any form of training / workshop on how to use these supplied tools you mentioned when you teach visually impaired learners?

K29: INTERVIEWEE: We get training no how to use them although when it comes to the surf, I didn't get specific training myself again.

K30: INTERVIEWER: As an educator for visually impaired learners, what do you think you could do for betterment of education for the visually impaired learners?

K31: INTERVIEWEE: You know when you ask me that I see red because we don't, I am sure that you won't be happy that I'll be saying, but I am gonna say this. We have a lot of problems with the Department of Education in certain areas. I ended up in Prim Govender's office because of the end of Grade 12,

talking of the exams, ehh they go from the point of view that because we are doing the mainstream syllabus, ehh they must be handled according to mainstream. Which according to me it's totally unfair. And I would do anything to fight against that because I just feel if you don't make exceptions, but be empathetic, have empathy and realize what the problems are and handle that accordingly.

K32: INTERVIEWER: Thank you for the information you gave me

INTERVIEWEE: Thank you.

INTERVIEW 12

L1: INTERVIEWER: Good afternoon, Mom

L2: INTERVIEWEE: Good afternoon, Pule.

L3: INTERVIEWER: In your view, what do you understand by Inclusive Education?

L4: INTERVIEWEE: inclusive education is about addressing the needs of all learners. In other words accommodating the variety and the diversity of each learner. Inclusive education permits education to be given in a different way to each child.

L5: INTERVIEWER: How relevant do you think is Inclusive education to the visual impaired?

L6: INTERVIEWEE: Okay, I thought about that and I think it's absolutely irrelevant especially if you think that the learning programs needs to be structured to be able to include the visually impaired learner. Though inclusive education strategies are very important in a school like ours.

L8: INTERVIEWER: How would you describe barriers to learning?

L9: INTERVIEWEE: There are different kinds of barriers to learning. You can first have the disability which of cause at our school, the visual disability. But there are other barriers to learning too. For example, the lack of language, eh you have the socio-economic barriers. You've got the cognitive barriers. So it is not only the visual child at a school like ours which is a barrier to learning. Language barriers can also be a difficulty for a child.

L10: INTERVIEWER: What type of barriers to learning do you think learners with visual impairments experience?

L11: INTERVIEWEE: I think the obvious barrier that the visually impaired learner experience is the learning material. The lack of learning material and the fact that everything has to be first electronically devised before give to a child. I think that is the most obvious barrier. Then of cause you also have your school environment which could be a barrier to certain child who is not always mobile as you would want a child to be. So the obvious one here is the visual loss where is either partially sighted or blind and then the mobility of the learner.

L12: INTERVIEWER: Have you received any training with regards to identifying, assessing and supporting different barriers to learning that the visual impaired experience?

L13: INTERVIEWEE: The only training that I received since I came here which is the internal training with its structures that are at a school in the beginning when I came here three years ago and immediately you have internal training for example, the sports services that immediately tells you about mobility, the different kind of eye problems etc. but ehh having someone telling you or training you on assessments and the different teaching, is something you pick up very well through previous experience. It's just like you have to accommodate it now.

L14: INTERVIEWER: So as you say, the training you did, you got it internally?

L15: INTERVIEWEE: That's right.

L16: INTERVIEWER: How would you describe your skills regarding the above mentioned training?

L17: INTERVIEWEE: Eh, I think one's skills you really learn when you teach because you have to think eh about all kinds of which is obvious angle in more curriculum. Also coming from mainstream curriculum, eh I think my skills are quiet good at this stage. But there is also more to learn. One can never say you know enough. Although I did not get formal training, for visual impairment and how to structure that eh your certainly learn on how to adapt the curriculum in various sections.

L18: INTERVIEWER: Please explain the type of formal qualifications you have with regard to teaching the visually impaired?

L19: INTERVIEWEE: Eh I haven't received any formal qualifications in it.

L20: INTERVIEWER: Did you receive any training / workshop about Inclusive Education? What type of training did you receive?

L21: INTERVIEWEE: Yes, I have received training quiet a few years, because I come from an LSEN school for learning impaired learners. I have about ten years experience of adapting curriculum to cognitive, mild, mentally handicapped, via through workshops, via through adaptations and courses etc. so in that kind of adapting the curriculum, yes I've got a lot of experience.

L22: INTERVIEWER: What type of problems do you sometimes encounter when you teach visually impaired children?

L23: INTERVIEWEE: I think a lot of problems that one encounter especially in a classroom is that you learner eh thinks more abstract, and that's very difficult sometimes to especially if you talk about learners seeing those areas and eh one would think that being a visual person yourself one would say that you should know certain things, but eh visually impaired learner does not automatically, you cannot take it for granted that such a learner knows about certain stuff, and that's usually very difficult to explain to a learner, very difficult to bring it in his/ her world to show the learner this is what we mean by that.

L24: INTERVIEWER: Which Information Communication Technology (ICT) tools do you use when you teach visually impaired learners?

L25: INTERVIEWEE: obviously we use a computer a lot. Eh electronic copies of whatever we have, electronic copy of Braille, and how to equip and how to print your own learning material and then of cause you need a lot of knowledge on eh CCTV cameras, how they are adapted, and I teach languages, so what I needed to teach with what they taught me at school was how to use the MAX mouse for dictionary work where learners could be able to use that.

L26: INTERVIEWER: Do you use any other tools except ICT mentioned in (11) above?

L27: INTERVIEWEE: No, not.

L28INTERVIEWER: Who supplies you with all the tools you mentioned above?

L29: INTERVIEWEE: The school supplies and what we do we also do it on lend to lend basis where we lend from one class to another class.

L30: INTERVIEWER: Did you receive any form of training / workshop on how to use these supplied tools you mentioned when you teach visually impaired learners?

L31: INTERVIEWEE: Yes, not formal workshop, but internally with the schools systems, eh usually they helped me as the new comer and my job is to help all the others.

L32: INTERVIEWER: As an educator for visually impaired learners, what do you think you could do for betterment of education for the visually impaired learners?

L33: INTERVIEWEE: Eh I think teaching methodologies must be different and I think eh I think visually impaired teacher, being, standing in front of visually impaired class, your teaching methodologies must be different. You must have other strategies in place to be able to bring the curriculum to the child because eh one, eh we are not using text books for example, and the obvious picture in the text you have to think differently, you have to accommodate and adapt to the child. Something that I also eh multilevel teaching is very important to know, I think eh through multilevel teaching, you look at the diversity of your learner. You look at different sense of your learner, especially when you teach eh slow learners. You sometimes have one of your learners are very slow and you have to accommodate him in your lessons and address the needs of that learner whilst in the same class there is a learner which is not so cognitively slow. So eh multilevel teaching is something that I think should be, must much more be addressed in a school.

L34: INTERVIEWER: Thank you very much for the information.

L35: INTERVIEWEE: That's my pleasure.

ADDENDUM C

CONSENT FORM

Dear Participant

You are cordially requested to consider taking part in the following Master's study research project:

The use of Information Communication Technology (ICT) in supporting learners with visual impairments in Special Schools.

The purpose of the research is to investigate what knowledge and skills teachers have of Information Communication Technology (ICT) in supporting learners with visual impairments in Special Schools.

Your participation is voluntary and you may withdraw your participation at any time.

You will be invited to take part in semi-structured individual interviews where basic questions will be asked related to your experiences of the impact of the use of ICT as well as your subsequent support needs. Dates and times that fit your schedule will be arranged.

There are no direct benefits or compensation. However, because of the movement to inclusive education, the South African system of education offers big challenges with regard to the support of learners experiencing barriers to learning, especially the visual impaired. The results of this research will be reported to the Department of Education and could consequently have a constructive impact on your teaching practice as well as on learners' with visual impairments' diverse needs.

Confidentiality: Data in this study will be kept confidential. It will also be kept locked at the North West University Vaal Triangle Campus for five years where after it will be destroyed. This research has been ethically approved by the

North West University ethical committee. (Ethics number: NWU-) This research is conducted by a Master's student, Mr Pule Serero, under the supervision of Dr. Mirna Nel at the Faculty of Education Sciences, Vaal Triangle Campus, North West University. If you have any queries regarding this research you are welcome to contact Mr.P.J Serero at 083 3003429 or Dr.M. Nel (Study Supervisor) at (o/h) 016 910 3095.

Consent:

I ---------- have read and understand the nature of my participation in this research project and agree to participate.

Names; ----------

Signature: ----------

Date: ----------

ADDENDUM D

LETTER OF APPROVAL FROM GAUTENG DEPARTMENT OF EDUCATION