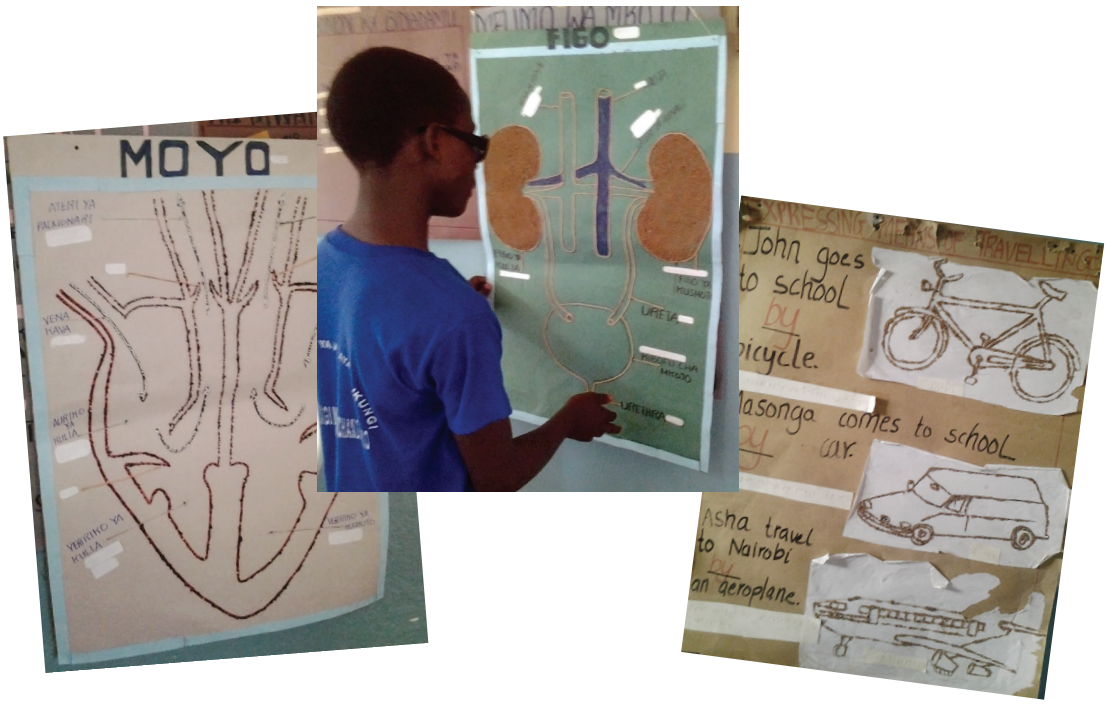
Åbo Akademi University

Cosmas B. F. Mnyanyi

Changing Teachers' Practices in Regular Schools Enrolling Children with Visual Impairment

An Action Research Project in Tanzania



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CHANGING TEACHERS' PRACTICES IN REGULAR SCHOOLS ENROLLING CHILDREN WITH VISUAL IMPAIRMENT

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Abstract

The number of persons with visual impairment in Tanzania is estimated to over 1.6 million. About half a million of these persons are children aged 7-13. Only about 1% of these children are enrolled in schools. The special schools and units are too few and in most cases they are far away from the children's homes. More and more regular schools are enrolling children with visual impairment, but the schools lack financial resources, tactile teaching materials and trained special education teachers. Children with visual impairment enrolled in regular schools seldom get enough support and often fail in examinations.

The general aim of this study was to contribute to increased knowledge and understanding about how teachers can change their teaching practices and thus facilitate the learning of children with visual impairment included in regular classrooms as they participate in an action research project. The project was conducted in a primary school in a poor rural region with a high frequency of blindness and visual impairment. The school was poorly resourced and the average number of pupils per class was 90. The teachers who participated in the collaborative action research project were the 14 teachers who taught blind or visually impaired pupils in grades 4 and 6, in total 6 pupils.

The action research project was conducted during a period of 6 months and was carried out in five cycles. The teachers were actively involved in all the project activities; identifying challenges, planning solutions, producing teaching materials, reflecting on outcomes, collaborating and evaluating. Empirical data was collected with questionnaires, interviews, observations and focus group discussions. The findings of the study show that the teachers managed to change their teaching practices through systematic reflection, analysis and collaboration. The teachers produced a variety of tactile teaching materials, which facilitated the learning of the pupils with visual impairment. The pupils learned better and felt more included in the regular classes. The teachers gained new knowledge and skills. They grew professionally and started to collaborate with each other.

The study contributes to new knowledge of how collaborative action research can be conducted in the area of special education in a Tanzanian school context. The study has also relevance to the planning of school-based professional development programs and teacher education programs in Tanzania and in other low-income countries. The results also point at strategies which can promote inclusion of children with disabilities in regular schools.

Keywords: action research, school-based professional development, visual impairment, inclusive education, teaching practices, Tanzania

Abstrakt

Det finns uppskattningsvis över 1,6 miljoner människor med synskador i Tanzania. Cirka en halv miljon av dessa personer är barn i åldern 7 till 13 år. Endast cirka 1 % av dessa barn går i skola. Specialskolornas och -klassernas antal är lågt och de flesta av specialskolorna är internatskolor belägna långt från elevernas hem. Allt fler vanliga grundskolor tar emellertid emot elever med synskador, men skolorna saknar resurser, material, taktila läromedel och utbildade speciallärare. De elever som går i vanliga skolor får sällan stöd och misslyckas ofta i de nationella examinationerna.

Det övergripande syftet med studien var att bidra till ökad kunskap om och förståelse för hur lärare kan förändra sina undervisningsmetoder och sålunda främja inlärningen hos elever med synskador som är integrerade i vanliga klasser medan de deltar i ett aktionsforskningsprojekt. Aktionsforskningsprojektet genomfördes i en grundskola i en fattig rural region med en hög frekvens av synskador och blindhet. Skolan hade brist på resurser och det genomsnittliga antalet elever per klass uppgick till 90. De 14 lärare som deltog i aktionsforskningsprojektet undervisade de blinda eller synskadade elever som gick i årskurserna 4 och 6, sammanlagt 6 elever.

Aktionsforskningsprojektet genomfördes under en period på sex månader och var indelad i fem utvecklingscykler. Lärarna var aktivt involverade i samtliga projektaktiviteter; identifiering av utmaningar, planering av lösningsförslag och åtgärder, produktion av läromedel och material, reflektion, samarbete och evaluering. Studiens empiriska data samlades in med enkäter, intervjuer, observationer och fokusgruppdiskussioner. Studiens resultat visar att lärarna kunde förändra sina undervisningspraktiker genom systematisk reflektion, analys och samverkan. Lärarna tillverkade olika typer av taktila undervisningsmaterial som främjade inlärningen hos de synskadade eleverna. Eleverna lärde sig bättre och kände sig mera inkluderade i undervisningen. Lärarna fick ny kunskap och nya färdigheter. De utvecklades professionellt och började samarbeta med varandra.

Studien bidrar med ny kunskap om hur aktionsforskningsprojekt inom det specialpedagogiska området kan genomföras i en tanzanisk skolkontext. Studien har även relevans för planering av kompetensutveckling, lärarfortbildning och lärarutbildning i såväl Tanzania som i andra utvecklingsländer. Resultaten pekar även på strategier som kan främja inkludering av barn med funktionsnedsättningar i vanliga skolor.

Nyckelord: aktionsforskning, professionell utveckling, synskada, inkluderande undervisning, undervisningsmetoder, Tanzania

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In my research work I was invited into the lives of the teachers of the children with visual impairment who were included in regular classes in my project school. To this end, I thank all the teachers who participated in my engaging and demanding research work. It was a learning experience for all concerned. The teachers showed me trust and respect. The teachers gave me their time and allowed me to sit in their classrooms. We indeed depended on each other as we were acknowledging and sharing the expertise we each brought to this research study.

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I dedicate this thesis to my late grandmother Muyolutwa

Vasa, November 20, 2014

Cosmas B. F. Mnyanyi

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1 Introduction

1.1 Background

This study is about changing teachers' practices in regular schools and classes enrolling children with visual impairment (children with VI[1]) in Tanzania. The methodological approach used in the study is action research (AR). Action research was chosen because it has the power to influence school teachers to change their teaching practices as they collaboratively reflect on and learn about their daily school practices (Chou, 2010; Crawford, 2007; Darling-Hammond, 2006; Zhang, Lundeberg, McConnell, Koehler & Eberhardt, 2010). To change practices means to create new knowledge and actions as a result of engaging community members in identifying problems and challenges and designing and implementing solution strategies. In this study teachers actively participated in the action research process, producing pedagogical knowledge as they continuously addressed challenges and problems they encountered when meeting the unique learning needs of all the children in their classes, especially children with VI.

Why is it relevant to focus on teachers' perceived challenges in teaching in the Tanzanian context? The question can be answered in terms of rights to education. Most people would agree that children with VI have a right to quality education, whether in developed or developing societies. However, the reality in most countries, especially in developing countries, is far from reaching that aim. This is also the case in Tanzania, which is the context of this study. In Tanzania a number of teacher in-service courses for improving classroom teaching have been implemented (Kafyulilo, Rugambuka & Moses, 2013; Mosha, 2004; Sekwao, 2004). However not much have been achieved especially in addressing teaching in classes enrolling children with disabilities. Earlier studies have shown that children with disabilities enrolled in overcrowded classrooms do not get much support from their teachers (Bartak & Fry, 2004; Mmbaga, 2002).

Formal education for persons with visual impairment has a history of over 60 years in Tanzania. However, education for persons with visual impairment has never reached the majority of this group. Education for the visually impaired was introduced in the 1950's in segregated settings, confined to special boarding schools, and mostly run by philanthropic organizations, especially non-governmental organizations (NGO) and faith based organizations (FBO). The

[1] Throughout the study I will use the term "children with VI" when I refer to learners in primary schools who have visual impairment.

Anglican Church started the first school for the blind in 1950 (Bagandanshwa, 1999; Kapinga, 2012; Mboya & Possi, 1996). One school, however, did not solve the huge challenges. In 1961 an international NGO called the Royal Commonwealth Society for the Blind commissioned a study to determine the best educational placement option for children with VI. The study report recommended integration as an option to increase access and participation in education of children with VI by partly including them in a regular classroom. The recommendations from the report started to be implemented on a small scale in 1962. Integration provides part-time inclusion in a mainstream setting in which the learner is not a full member of the classroom and the school activities. In an integrated education system the participation depends on the children strengths and needs (Chadha, 2003; Winzer, Rogow & David, 1987). In inclusion[2], on the other hand, all pupils are able to join all activities in the school and classroom, regardless of abilities and/or disabilities.

Educating children with VI through integration meant more than physical placement. Integration in this context refers to children with VI being educated alongside their sighted peers in regular schools with support from specialist teachers and the provision of special equipment including learning materials in a resource room. The first resource room for visually impaired children in Tanzania was built in 1962 at Uhuru Mchanganyiko Primary School[3] in Dar es Salaam. Later, more resource rooms were established for different regions in the country. Most of the schools with resource rooms had boarding facilities as many children were coming from long distances and needed special support. This is also the situation today: most of the schools for children with disabilities in Tanzania have boarding facilities.

The system of educating children with disabilities through use of resource rooms with boarding facilities has many weaknesses and is expensive to implement (Evans, 2004). A challenge in both special schools and integrated educational placements for children with VI is related to the low number of special schools with few boarding facilities. Another challenge is the fact that many children with VI, provided they are enrolled, have to travel a long distance to the schools. This means that the children must spend most of their time away from their families. Schools with resource rooms are also an option, but in most cases the schools with resource rooms are unable to enrol many children beyond their capacity and have shortages of teaching resources and teachers trained to support children with VI. Therefore, lack of special schools and schools with resource rooms, the cost of transport, and shortages of learning materials and equipment, and the low availability of specialist teachers all pose problems in creating

[2] I use the term "included" in the study when I refer to children with VI who are enrolled in regular schools and attend regular classes, although I am aware that the inclusion does not meet the requirements of "real" inclusion. In most cases inclusion in Tanzania is nothing more than physical integration.

[3]Uhuru Mchanganyiko Primary School in Dar es Salaam Tanzania to date enrolls children with different types of disabilities including the mentally retarded, visually impaired, and deaf-blind.

access for a large number of children with VI in the country. The majority of children with VI have no access to education.

In the late 1990's the idea of inclusive education reached Tanzania as a result of the inclusion movement world-wide. According to the Salamanca Statement, of which Tanzania is a signatory, the guiding principle is that ordinary schools should accommodate all children, regardless of their physical, intellectual, social, emotional, linguistic or other conditions. Educational policies stipulated that disabled children should have a right to attend the neighbourhood school that would be attended if the child did not have a disability (Farrell, 2000; Smelter, Rasch, & Yudewitz, 1994). The reasons for enhancing inclusion are that regular schools with inclusive orientation are regarded to be the most effective means of combating discriminatory attitudes, creating welcoming communities, building an inclusive society and achieving education for all. Moreover, they provide an effective education for the majority of children and improve the efficiency and ultimately the cost-effectiveness of the entire education system (Ainscow & César, 2006; Winter, 2006).

Regular schools in Tanzania started enrolling children with disabilities in 1997 as a pilot project in seven schools in Dar es Salaam (Mmbaga, 2002). The pilot project was supported by UNESCO and the Salvation Army, aiming at implementing inclusive education in Tanzania. However, the implementation started without guidelines on how to implement and adapt the general curriculum. Teachers who were assigned to implement inclusive education were regular teachers who were not trained to cater for the needs of children with different special needs (Mmari, Mzee & Frankeberg, 2008). This was also the case for children with VI. The pilot schools became more inclusive to some extent, as teachers got training and the school infrastructures were modified to suit inclusive education. Furthermore, the pilot involved three schools that had resource rooms for children with disabilities. Another result of the project was that 12 persons were trained as national inclusive education facilitators (Ainscow, 2003; Miles et al., 2003; Mwakyeja, 2013). Including children with special needs in regular schools was meant to improve their access to education. Researchers (Croft, 2010; Davis & Hopwood, 2002; Friend & Bursuck, 1996; O'Hanlon, 2003; Reiser & Mason, 1992) argue that the education of children with VI within regular education settings with untrained teaching staff in special education raises concerns as children with visual impairment encounter problems in participating in the teaching and learning process (Possi, 1999; Possi, 2006). This is also the case in Tanzania, where the challenges are even bigger, keeping in mind the poor quality of teacher education (Chambulila, 2013; Meena, 2009). For effective learning, children with VI require an adapted curriculum, Braille print and tactile teaching materials. Few teachers in Tanzania are trained to support learners with visual impairment, including preparation of tactile teaching materials, reading and writing Braille text.

As it became apparent that the mere placement of children with VI in regular classes was not sufficient, so a new strategy to increase the participation of children with VI in education was introduced. Itinerant teachers, specializing in

visual impairment, were trained and employed to support visually impaired children enrolled in regular schools (Lynch &McCall, 2007). Peripatetic teachers provide support services in schools and are engaged in home-based programs[4]. The specialist teachers support regular teachers in transcribing children's assignments written in Braille into normal print for teachers to evaluate the progress and achievement of children with VI. The home-based programs and the units attached to regular schools are supported by the Tanzania Society for the Blind (TSB), a non-government organization in partnership with the government[5]. In home-based programs organized by the TSB, children with VI learn the survival skills to help them understand the environment communicate effectively and cooperate with sighted peers in regular schools. Whereas some of the children with VI enrolled in primary schools receive some basic training in the home-based programs, teachers receive these children into their classrooms without any special training and thus lack the skills to support their learning. Children with VI needing professional support in classrooms and in schools in Tanzania continue to increase in number, as the prevalence of visual impairment is on the increase due to disease, poverty and illiteracy. The national survey on disability in 2008 with participants from about 7000 households distributed in 26 regions in Tanzania estimated the prevalence of visual impairment to be 3.7% of the disabled population (National Bureau of Statistics [NBS], 2008). The figure can be considered to be high when compared to the national total disability prevalence rate, which was estimated to be 7.8% of the entire population. Almost half of all registered persons with disabilities have visual impairment, which means a great challenge for the education of children with VI. Educational services for children with VI and other types of disabilities in Tanzania suffer from shortages of support devices, and a lack of teachers with the required skills, knowledge and orientation (Bagandanshwa, 1999; Bagandanshwa, 2004; Kapinga, 2012; Miron, 1993; Tungaraza, 2014).

School inspectors' reports and personal experience indicate gaps in the educational services for visually impaired and blind people in Tanzania. Moreover, schools are faced with the challenges of large class sizes, an inadequately prepared teaching force and a lack of professional development opportunities for teachers, as well as shortages of teaching materials, including appropriate text and reference books (Malmberg, Wanner, Sumra & Little, 2001). There are also other challenges: inadequate teaching materials and technical facilities, a shortage of eye specialists, lack of qualified persons to carry out assessments, a shortage of assessment centre to determine intervention strategies, shortages of skilled teachers to address barriers to learning, and poor school infrastructures (Eklindh & Brule-Balescut, 2006; Meena, 2009).

[4] Home-based program is a type of educational placement where the itinerant teacher follows children with VI and provides educational services at the family level.

[5]The TSB provides experts trained in Braille skills and required equipment and the government of Tanzania pays the salaries of its employees. Home-based programs in Tanzania prepare children with visual impairment who are expected to be enrolled in regular schools.

According to Rajani (2003), the issue of teacher education for teachers of children with disabilities is connected to educational plans that do not take on-board disability issues in education.

Some of the challenges faced by teachers of children with visual impairment in Tanzania are embedded within the assessment system (Malekela, 2004). Experience indicates that teachers put emphasis on completion of the syllabus in order to prepare children for examinations. Since it is in the teachers' interest for children to pass examinations, they tend to choose teaching methods which are less time-consuming, less interactive and which do not foster critical thinking or self-reflection on the part of the learners (Cooksey & Riedmiller, 1997; Mahenge, 2004; Malekela, 2004). Such teaching methods focus on facts and figures presented in the curriculum. The use of non-interactive teaching methods in classes enrolling children with VI in association with teachers who lack knowledge and skills in how to support the learning of pupils with diverse learning needs makes the situation difficult for all children, but especially for those with visual impairment.

What teachers do in the classroom seems to reveal a gap between initial teacher training and adequate classroom practices in schools enrolling children with VI. Student teachers in teacher training colleges are not taught how to facilitate learning in inclusive classrooms. Professional development focusing on inclusive education practices is given little attention in schools. Regular teachers do not know how to use and adapt available teaching and learning resources which could promote the learning of children with VI. The change in teaching practices in schools depends on the possibility to change the tradition of rote learning that exists in schools in order to make learners more active (Mahenge, 2004). Changing teacher practices is context-bound (Chou, 2010; De Young, 1991; Harmon, Gordainier, Henry, & George, 2007; Rönnerman, 2008; Somekh, 2006). Different schools have different contexts and might require different strategies to change teaching practices. The selection of strategies to use can be related to the availability of resources, but also to knowledge, skills and attitudes.

One of the ways to change teaching practices is to embrace school-based professional development using action research where teachers are facilitated to analyse their teaching challenges and to develop plans which address those challenges, to implement and evaluate the plans for further understanding and action taking (Argyropoulos & Nikolaraizi, 2009; Cardno, 2006; Carr & Kemmis, 1986; Elliott, 1990; Elliott, 1991; Honig & Rainey, 2012; Hord, 2004; Kemmis, 2006; Postholm & Skrøvset, 2013; Rönnerman, 2008). Action research is regarded as systematic school-based professional development as it takes place in an authentic context, the school and the classroom, and as it allows teachers to plan, act and evaluate as they continuously engage in activities which improve their school practices (Foulger, 2010). There are no well-established systems for teacher professional development in Tanzania (Komba & Nkumbi, 2008). Tanzanian schools face challenges in enrolling children with VI with regard to teacher competence. The teachers do not know how to teach children

with disabilities. Though action research as a type of systematic school-based professional development has promising findings in terms of enhancing the inclusion of children with disabilities it has not been practiced in Tanzania. For example, in Greece, the positive effects of facilitating teachers in developing inclusion practices for blind children using collaborative action research are reported (Argyropoulos & Nikolaraizi, 2009; Argyropoulos & Stamouli 2006).

School-based based action research projects are believed to influence teachers' classroom practices and the school as a social system (Elliott, 1993; Elliott, 1991; James, 2006). Action research as school development has been carried out in many Western countries; in low-income countries like Tanzania the strategy is not well-known. Findings from Lloyd (2002) indicate that developed countries like Germany, Belgium, France, and Luxembourg use school-based action research and that teachers who participated in school-based professional development for 2 to 3 years in addition to undergraduate studies are satisfied with their teacher preparation and are viewed as well-prepared compared to traditional residential teacher training (Andrew &Schwab, 1995; Darling-Hammond, 2000; Elliott 2007; Walker 2009). In Africa, in countries like Uganda and Guinea Bissau the use of classroom-based teacher professional development strategies as in-service training of teachers has shown positive results in changing school teaching practices (Verspoor, 2008). Little is known in developing countries and especially in the African and Tanzanian context about the use of action research in changing teacher practices in schools enrolling children with special needs and disabilities.

1.2 Motives for the study

In section 1.1 I have presented the general background of the study. In this section I outline the motives that guided my choice of research topic. This research topic was chosen based on four motives. The first is rooted in the implementation of inclusive education in Tanzania. Studies on the facilitation of learning to individuals with special needs and disabilities in Tanzania (Bartak & Fry, 2004; Kapinga, 2012; Karakoski & Ström, 2005; Mboya, Mbise, Tungaraza, Mmbaga, Kisanji & Madai, 2008; Mmbaga, 2002; Mmari, Mzee& Frankenberg, 2008; Mwakyeja, 2013) reveal weaknesses in implementing inclusive education. Both initial and in-service teacher education rarely prepare teachers for inclusive education. Apart from inadequate teacher preparation for inclusive education, the quality of teacher education in Tanzania is questionable (Chambulila, 2013; Komba & Nkumbi, 2008; Meena, 2009; Mosha, 2012; Msonde, 2009). In 2009, Ministry of Education and Vocational Training (MoEVT) launched a National Strategy on Inclusive Education (2009 – 2017). There is a need therefore to find ways to support teachers so that they develop knowledge and skills in supporting children with disabilities who are included in regular schools. Only in this way can Tanzania live up to the requirements of international policy guidelines on inclusive education.

The second motive is connected to a need for research that focuses on developing the teaching force in inclusive classrooms in Tanzania. In Tanzania studies about inclusive education focus on schools. Few studies if any focus on teacher development for inclusive education. Kapinga (2012) has focused on teachers' motives for professional development in special education; Mwakyeja (2013) investigated the teaching of students with visual impairment in inclusive classrooms at secondary school level and Mboya et al. (2008) looked at situational analysis and needs assessment in special needs and inclusive education in Tanzania. In general, study about how regular teachers change their teaching practices and support the learning of children with visual impairment has not been conducted. Furthermore, none of the studies has adopted an action research approach. In action research the participants, the teachers in this case, are involved in better understanding and improving their practices and the context in which they work. Teachers participating in action research get involved in producing knowledge that later becomes useful to others and contributes to social reconstruction (Chambers, 1997; 1998; Mourshed, Chinez & Barber, 2010; Noffke, 1997).

The third motive is connected to rights to education. Children with VI have a right to education of good quality just as sighted children (Farrell, 2000). Tanzania is a signatory of international agreements with focus on education, including Human Rights (1948), the Salamanca Framework of Action in 1994, the Dakar Framework of action in 2000, the Rights of the Child in 1989 and the African Charter on the Rights and Welfare of the Child in 1990, which entered into force in 1999. Similarly, internally, Tanzania has an Education Act of 1978 and its amendment in 1995, the Disability Policy of 2004, the Disability Act number 9 of 2010 and the Inclusive Education Strategy (2009-2017) of 2009. All these documents indicate that children with disabilities have a right to education. To implement policies, acts, and strategies in creating equal opportunity in education, teachers are the most important component. Teachers facilitate learning and are likely to encourage children to be enrolled, participate in learning and have positive achievement in schools. Little is known about strategies developed for supporting teachers in changing teaching practices for creating inclusive teaching and learning strategies that would foster inclusion in the society. We are witnessing change in technology that includes the introduction of ICT in schools, e-learning and changing composition and size of classrooms. As socio-economic changes are dynamic, the need for teachers to develop strategies to facilitate learning of a dynamic nature is of high importance. This calls for teachers not only to become practitioners but also developers and consumers of knowledge.

The fourth motive for selecting action based research in inclusive education is based on my own interest and experience in the education system in Tanzania. I have been in the teaching profession for over 20 years, holding different positions ranging from classroom teacher, teacher educator, school inspector, assistant lecturer and lecturer in special and inclusive education. As a teacher, teacher educator, school inspector, and lecturer I have been involved in several

programs and projects addressing the issue of facilitating learning in inclusive settings and those addressing the quality of teacher education in Tanzania. My experience in the field of special education has helped me to see what changes in system, school and classroom level are necessary. As a lecturer in special and inclusive education, my ambition is that the study will contribute to the generation of new knowledge on how to facilitate teacher professional development in implementing inclusive education in Tanzania and beyond where the focus is on changing practices.

1.3 Research problem and general aim

The research problem addressed in this study aims at describing and developing an understanding of how action research can be used in order to develop and change teaching practices and thus to support the learning of children with VI enrolled in regular schools which lack the resources necessary for quality education, appropriate education for children with VI, teachers trained in special education, teaching material and equipment and special devices that could support the learning of children with VI in Tanzanian schools. Based on this research problem the general aim of the study is as follows:

The general aim of this study is to contribute to increased knowledge and understanding about how teachers can change their teaching practices and thus facilitate the learning of children with visual impairment included in regular classrooms as they participate in an action research project.

The focus is on teachers' knowledge and understanding of their practices resulting from reflection and analysis of teaching practices. Since action research was chosen as the methodological approach I was interested in finding out whether teachers can improve their support for children with VI as they participate in an action research process and during the process develop teaching materials, employ various teaching methods, identify learners' needs, and solve their professional problems and challenges in facilitating learning for children with VI. The main part of the action research project was implemented in a typical rural primary school because rural schools in Tanzania face more challenges than urban schools in terms of human, physical and fiscal resources. The findings from this study can contribute to a better understanding of how regular teachers, when supported in reflecting, exploring and analysing their own teaching practices, can change their practices and thus facilitate the learning of diverse learners enrolled in their schools. At the level of practice the findings could be used to sensitize policy-makers, managers, teachers, tutors, and administrators to the need to design different kinds of school-based teacher professional development programs through action research aiming at developing teaching practices in schools which include children with special needs and disabilities. In so doing, the study can contribute to bridging the gap between research and practice in teacher education in order to promote professional activities in schools. The study is also expected to contribute to

research in the field of action research and special and inclusive education in Tanzania and beyond.

1.4 Structure of the thesis

The thesis consists of eight chapters. The introduction in chapter 1, which focuses on background, motives and general aim, is followed by a literature review (chapters 2-5). The literature review is related to the context of the study, teacher education, teacher practices in educating children with VI, and action research as a tool for facilitating change in teacher practices with respect to including pupils with special educational needs and disabilities. Chapter 6 describes the research methodology used for conducting the study, including details of the participants in the study, type of data collection instruments used, procedures for data collection and data analysis, trustworthiness and ethical aspects. Chapter 7 presents the findings of the study. A description of the five phases of the action research study forms the actual results of the study. Chapter 8 provides a discussion of the study's methodological considerations and findings, including conclusions. The chapter ends with a way forward, implications of the study and proposed further research.

The study follows the format of a traditional research report with introduction, literature review, method, findings and discussion. Although there is no fixed format for reporting action research studies and the researcher is free to choose the format that suits the process and the data, I chose the traditional format for contextual reasons. My assumption was that scholars and those who will receive and read my study in Tanzania and beyond are familiar with the chosen format. I hope this thesis will be of use for policy-makers and teachers who are struggling to implement inclusive education.

2 Context of the study

Tanzania is a country located in East Africa. Tanzania borders Kenya and Uganda to the north, Rwanda, Burundi, and the Democratic Republic of Congo to the west, the Indian Ocean in the east, and Zambia, Malawi and Mozambique in the south. Tanzania is the largest country in East Africa (943,000 sq km), comprising both the mainland and the Zanzibar Archipelago. Tanzania's population in 2013 was estimated to be around 44 million (National Bureau of Statistics [NBS], 2011).

In this section of the study, I describe the education system in Tanzania, inclusive education and teacher education. These three aspects of education in Tanzania are considered as important for understanding of the context in which the study was conducted. A discussion of the education system is included in order to give the reader a picture on how education is managed and its challenges as related to children with VI. The development of inclusive education and teacher education is included as it gives an understanding of the context in which the need for changing teachers' practices in schools enrolling children with VI becomes apparent.

2.1 The education system in Tanzania

Tanzania is predominantly agrarian as over 85% of its population depends on agriculture and agricultural-related activities. Education has always been an important issue, at least on the political agenda. In 1967 the country adopted the philosophy of Education for Self-Reliance (ESR) with the aim of ensuring that education is a key to creating self-employment opportunities for all. As a result of this philosophy, basic education that included primary and adult education was linked to practical activities, especially agriculture (Temu, 1999). The goals of ESR were to increase people's physical and mental freedom - to increase their control over themselves, their own lives and the environment in which they live, and to prepare people for a meaningful and productive life, and for service in the villages and rural areas (Benson, 2006; Nyerere, 1968). Schools were designed to be centres for social and economic development. The implementation of ESR goals led to the expansion of basic education to nearly reach the universal primary education (UPE) goals in the 1980s. However, this success did not appear to have positive outcomes in relation to reduced fertility rates, improved agricultural productivity, creation of entrepreneurship skills among basic education graduates and overall economic growth (Wedgwood, 2005).

Since its independence in 1961, Tanzania has been struggling to combat disease, poverty and ignorance. The country resolved to fight illiteracy as one of the

ways of combating ignorance. Basic education[6] is meant to impart knowledge and skills in writing, reading and counting which are important in supporting individuals in improving their quality of life. However, only limited efforts are made to include individuals with visual impairment and other disabilities in these educational innovations. There are three reasons for this. The policies and the innovations themselves do not take into consideration the special needs of people with visual impairment. Policies such as the Education and Training Policy of 1995, emphasizes education for all, but few provisions are made for pupils with special needs and disabilities. Second, community attitudes are such that people with visual impairment are not believed to have the capacity to equally learn and complete study cycles like their sighted peers. Third, individuals selected to teach in many schools have inadequate skills to support the learning of pupils with VI. In most cases persons entering teaching are those with low pass grades in secondary schools, which means that they have less mastery of subject contents (Mosha 2004). Therefore, individuals with visual impairment have few options in accessing education in formal, non-formal[7] and informal[8] education sectors.

The formal education system in Tanzania is based on the 2-7-4-2-3+ system (Meena, 2009). The first two years comprise pre-primary education, where children aged 5 to 6 are to be enrolled. However, pre-primary is not compulsory. Pre-primary education is faced with challenges that result in poor harmonization between pre-primary and primary education in Tanzania. This is the case for most children, but especially for children with special needs and disabilities who do not have formalized pre-primary education in the government owned schools. Pre-primary education for children with disabilities in Tanzania where provided is through the support of international organizations, non-profit making organizations, parents associations and a few special schools, making it difficult for most of parents of children with disabilities to afford it. Primary education is provided to children aged 7-14 years old. It is a seven year education program and is compulsory and universal according to the Education Act of 1978 and its amendments number 10 of 1995. After primary school level, not all go to the next level, which is 4 years of early secondary education. The transition rate from primary to secondary education is increasing; for example, the transition rate rose from 30.1% in 2003 to 67.5% in 2007 as a result of the expansion of community secondary schools (Jidamva, 2012). Few students go for the two

[6]Basic education in Tanzania comprises pre-primary, primary education and adult education

[7]Non-formal education uses a flexible curriculum and methodology; it does not require student attendance, few face to face contacts between teacher and students, and most activities take place outside the institution - as for instance, home reading and paperwork (URT, 1995). Fordham (1993) places the relevance of non-formal education among others as supporting the disadvantaged population.

[8] Informal education does not have a defined curriculum; does not impose regulations of whatever kind; the focus is not on providing degrees or diplomas. Learning can be through listening to radio, watching TV and/or visiting museums (URT, 1995).

years of advanced level education and later three or more years of University education (Basic Education Statistics of Tanzania (BEST), 2007-2011). The transition rate for pupils with disabilities is not known due to incomplete statistics. Whereas by 2010 there were 36,585 (about 0.35% of school enrolees) children with disabilities enrolled in primary education, few manage to complete the education cycle in 7 years (BEST, 2010).

The description of the education system in Tanzania is included in the study mainly for two reasons. First, to describe student achievement in different education system levels and show the way they relate to teacher education and in Tanzania the need for supporting teachers through the provision of professional development opportunities. Secondly, to show that education in Tanzania is measured through examination performance at all levels, resulting in teachers focusing on preparing children to pass examinations. Examinations, therefore, are instrumental in educational progress and certification. At each level a person has to sit examinations and pass in order to be promoted to the next level of education. Examinations put pressure on both teachers and learners. In this kind of system individuals with VI are at risk of being excluded although they are enrolled in regular classrooms. Another example of inequality in the Tanzanian system is access to the curriculum for children with VI. Though accessing the general curriculum is a human rights issue, children with visual impairment do not have the possibility to study mathematics after primary education, though it is a compulsory subject for all children and as such included in the examinations (Akakandelwa & Munsanje, 2012; Masanja, 2004; Rowe, 2014).

In Tanzania, the measure of academic competence is through written examinations. This increases pressure on teachers in facilitating children to pass examinations, resulting in teaching being more examination-based rather than competence-based. Malekela (2004) and Otieno (2000) disclose that children's performance is based on examinations, yet a number of children complete primary school education without the skills of reading and writing. The question of students completing primary education without mastering skills in reading and writing has become a topical agenda in Tanzania (Kuleana, 1999, Kalanje, 2011). This can be attributed to teachers not having the skills to determine children at risk in developing reading and writing abilities (Kalanje, 2011). Primary education is meant to prepare people to develop literacy skills, and thus calls for teachers to develop skills that would help them in facilitating learning for all children. The situation might be worse for children with disabilities as teachers are not well prepared to cater for their learning needs. There is a need, therefore, to support teachers in changing their practices so that they support the learning of all children enrolled in regular schools, including children with VI.

2.2 Access to and quality of education in Tanzania

Access to education for all pupils is influenced by teacher pupil ratio, enrolment, teacher recruitment, teacher support through professional development opportunities, and teacher knowledge and skills in facilitating the learning of all children. Since 1997 students with disabilities started to be enrolled in regular schools as a step toward implementing inclusive education. During this time also children with visual impairment were also enrolled. The increased enrolment resulted in some schools using double shifts (Babyegeya, 2007), which had detrimental effects on children with and without disabilities in primary schools as affected the learning time. The challenges related to equity in education for children with VI as a result of the increased enrolment were two-fold: teachers had not been prepared in terms of the knowledge and skills needed to teach children with disabilities included in their classes appropriately, and school time was reduced, for example the length of a period changed from 40 minutes to 30 minutes. These changes were implemented in many primary schools without having appropriately qualified staff. As a result, many children failed to learn the necessary skills and knowledge which would enable them to pursue further education in secondary and higher education and to improve their quality of life (Wedgwood, 2005). The challenge is much greater for individuals with disabilities whose support largely depends on donor funds. Where government allocates funds to schools, little or no consideration is given to children with special needs. The poor availability of resources has resulted in lack of support for children with disabilities; hence the benefits of education that include improved agriculture, employment, and entrepreneurship, reduced fertility rates and reduced rates of diseases do not reach persons with disabilities.

Enrolment in primary education in Tanzania fell from 98% in the 1980s to less than 70% in 2002 and was critically lower in the 1990s (Mbelle & Katabaro, 2005). Government guidelines and policies, (for example the Education and Training Policy of 1995, Education Sector Development Program (ESDP) of 1996, and the Local Government Reforms of 1998) have guided the planning and implementation of education plans in Tanzania. These policy reforms led to a quantitative expansion of primary education, at the expense of quality and lack of strategic plans to sustain the achievements (Palmer, Wedgwood, Hayman, King & Thin, 2007; Wedgwood, 2005). School enrolment was a bigger problem in rural schools compared to urban ones. Rural primary schools are characterized by low numbers of teachers, poor school infrastructure, and lack of teacher houses, shortages of in-service training opportunities and insufficient teaching and learning materials. As a result of this the few available teachers could not support the learning of all children. Especially the situation for low achieving children was bad. The situation resulted in some parents paying extra money to teachers for tuition. However, for parents with children with disabilities paying for extra tuition was not a realistic option due to poverty and the low number of teachers specialized in special education.

The decreasing enrolment rates and the problems in schools led to new government initiatives. In 2001 Tanzania started implementing the Primary Education Development Program (PEDP) as one of the components of the Education Sector Development Program (ESDP). The targets in the PEDP implementation were expansion of enrolment through the construction of classrooms, teacher preparation and deployment, quality improvement through provision of more teaching and learning materials and capacity building to improve management systems (Mbelle & Katabaro, 2005; URT, 2001). However, though these programs did not target special education to any large extent, nevertheless an increase in the enrolment rates of children with disabilities in primary schools could be noticed. The number of children with disabilities enrolled in primary education increased from 5,365 children in 2005 to 8,583 in 2007, which was an increase of 59.9 percent (URT, 2008).The increase of enrolment to 59.9% might give a too optimistic impression since 8000 pupils with disabilities in a country of over 40 million people facing both economic and health challenges is still a very small number.

One of the goals of PEDP was to increase the number of teachers and to create upgrading courses for teachers (URT, 2001). In the PEDP implementation a number of teacher professional development programs, especially teaching methods and management efficiency programs, increased marginally (Mbelle, 2008). Other PEDP goals were improving the quality of teaching and learning, increasing funding available at the school level, and making institutional arrangements more democratic and transparent throughout the education system (Sumra, 2003; Rajani, 2003; UNESCO, 2004; URT, 2002). In Tanzania, efforts to increase access to education can be said to have been made. In implementing PEDP in Tanzania, teacher education and teacher supply faced the challenge of the number and quality of teachers. The strategy have had to increase number of teachers as the teacher-pupil ratio increased to 1:46 in 2001, 1:53 in 2002, and 1:57 in 2003, with a wide regional variation (from 1:39.8 in Kilimanjaro to 1:73.5 in Mwanza). In this situation children with disabilities rarely got support from teachers (Mmbaga, 2002; Possi, 2006).

The first phase of PEDP created awareness in parents and other education stakeholders, and worked towards improving the quality of education. It was the awareness created that made many parents, including parents of children with disabilities, to enrol their children in the education system. According to Mbelle (2008), challenges in implementing PEDP were related to ‘input and costs’. Inputs to the schools included teacher quantity and quality, teaching resources, learner background and learner characteristics. With teacher quality, many teachers were unable to meet the learning needs in a diverse classroom. Teaching resources and school infrastructures did not meet the learning needs of children with disabilities, resulting in poor learning achievement in the school curriculum.

In ensuring quality, a budget to incur costs related to services provided in schools that include professional development was viewed as important. Without any mention of strategies, Mbelle (2008) suggested the creation of a welcoming and accommodating learning environment for individuals with

disabilities in primary education. However, the question is: what are the strategies that could create an inclusive education environment for all children, including children with VI? Children with disabilities have specific difficulties and needs. Thus, strategies to create an appropriate learning environment require, among other things, specific knowledge and skills among teachers who are supposed to implement the strategies.

2.3 Inclusive education in Tanzania

The international inclusive education movement reached Tanzania in the late 1990´s. The starting point was the Salamanca Declaration on Inclusive Education that calls for government and organizations to provide education for children, youth and adults with special educational needs within the regular education system (UNESCO, 1994). Inclusive education, therefore, is a placement where children with special needs are included in regular schools and taught by regular teachers. The Salamanca Declaration affirms that every child has a fundamental right to education and must be given the opportunity to achieve and maintain an acceptable level of learning. According to the declaration, inclusive education is an effective means to combat discriminatory attitudes and hence increases the cost-effectiveness of the entire education system. Placing children with disabilities in a regular class coupled with the use of child-centred pedagogy has the capability of meeting the needs of all children (Lewis & Little, 2007; Lewis & Norwich, 2005; Possi, 2006). Individuals with and without special needs have the right to equally enjoy all aspects of life, including a right to education (Madan & Sharma, 2013). Therefore, teachers need some form of training in order to cater for the needs of children with visual impairment included in their classes. As inclusive education is to be practiced in all schools, it is not possible to re-train all the teachers by sending them to teacher colleges. This calls for teachers to increase their chances of learning through flexible means such as in-service training and professional development programs.

In Tanzania, inclusive education started in a pilot project in Temeke District in Dar es Salaam in 1997 (Mmbaga, 2002). Seven schools participated in the pilot project, which then spread to other districts. By 2008 about 208 primary schools in the country were implementing inclusive education (Mwakyeja, 2013). In increasing schools practicing inclusive education in Tanzania UNESCO organized training for a national facilitation team comprising 12 members (Miles, et al., 2003). The facilitation team used a so-called ‘Special Needs in the Classroom Resource Pack’ (UNESCO, 1993). Later in the project each of the participating schools had two project classes supported by the national team. The project classes under the UNESCO project were required to have only 35 children, of which 5 were children identified to have disabilities. After the training of the national facilitators 70 school teachers were trained in effective teaching through a school-based approach. The UNESCO funding ended in 1999, but MoEVT and Temeke Municipality continued supporting the inclusive

school project (Miles, et al., 2003; Mwakyeja, 2013). However, the UNESCO project implementation was not evaluated to determine the project achievements, challenges and lessons learnt. In reality, the project had little impact.

Development of inclusive education was a result of partnerships with non-government agencies, government and other donors, both at national and international level. The partnerships formed contributed to awareness-creating among teachers, parents, educational administrators and school inspectors through short courses and seminars. These initiatives were thought to promote the implementation of inclusive education. This succeeded only to a certain extent. With the initiation and implementation of inclusive education a number of children with disabilities have been included in regular classes in Tanzania (BEST, 2010; Mmbaga, 2002; Polat & Kisanji, 2009; Possi, 1999). However, the numbers have remained rather small. The population data on disability is not available, but the total number of children with disabilities enrolled in schools in 2012 was 28,195 pupils (BEST, 2012). Primary school age in Tanzania is estimated to be 7-13 years. Estimating from the population data in the national census of 2012 in Tanzania indicates that there are 8,584,317 children aged 7-13 years (NBS, 2012) and using the national prevalence rate of 7.8% (NBS, 2008) the estimate of children with disabilities amounts to 669,577, of which only 28,195 (4.2%) are enrolled in schools. Children with visual impairment aged 7–13 years are estimated to be 458,712, of which only 2,878 (0.9%) are in school (BEST, 2012). The small percentages indicate that few children with disabilities get the opportunity to be enrolled in schools.

In the light of these strategies, where regular classes are supposed to include children with visual impairment and regular teachers are supposed to teach all children, teachers need support in understanding how to support learners with disabilities. Since education has the power to enhance the quality of life for individuals, there is a need to find ways of improving teaching and learning in classes which include different kinds of pupils (Agbenyega, 2007; Possi, 2006; Snyder, 1999) so that each child gets the knowledge and skills needed to improve their quality of life.

Participation for all children in any educational system requires all children to access and complete the education cycle. Both developed and developing nations aim at including all children in accessing learning opportunities to improve their quality of life (Arbeiter & Hartley, 2002; Kisanji, 1998; Loreman, Forlin & Sharma, 2007). No children should be denied enrolment, attainment and completion of the basic education cycle for any reason such as disability, poverty, disease and any other special need that might be a barrier to basic education. For all children to access education the focus is on teachers. Teachers are the facilitators of learning among children. However, diversity in education has not been considered important in regular teacher preparation programs (Howard & Aleman, 2008). This is also the case in Tanzania: teacher education has put very little emphasis on special needs education (Kapinga, 2012;

Bagandanshwa, 2004). (Teacher education is discussed more in detail in chapter 2.4).

The challenges in inclusive education focus on the principle contributors to primary education effectiveness such as curriculum, learning materials, instructional time, classroom teaching, students' learning capacity, school facilities, teacher training and management (Boissiere, 2004; Lockhead & Verspoor, 1991; World Bank, 1990). The question is how these important factors can be implemented in inclusive classes in regular schools. In Tanzania, as in other developing countries, where economies of scales are low, there are many other factors besides teacher factors which make the implementation of inclusive education challenging. However, if teachers are not well-prepared it is not easy for teachers to make the curriculum accessible for learners with disabilities (Osaki, 2000a).

In order to promote inclusive education, inclusive education knowledge and skills need to be cultivated and nurtured within school settings. To nurture inclusive education qualified teachers are a key to success (Barton, 2005; Beattie, Anderson & Antok, 1997; Malone, Gallagher & Long, 2001). The success of inclusive education largely depends on teacher attitudes, willingness, knowledge and skills to involve children with disabilities in their teaching (Loreman, Forlin & Sharma, 2007). Qualified special education teachers are also needed, but as the number of special education teachers is low in relation to regular teachers in Tanzania (Karakoski & Ström, 2005), the main focus should be on improving the quality and content knowledge of regular teacher education using different ways, including school-based teacher professional development and engagement of teachers in implementing action research projects.

In Tanzania inclusive education is being implemented. Regular schools are increasingly enrolling children with different types of disabilities. The proportion of children with disabilities in schools is increasing as regular schools are enrolling children with disabilities, resulting in a multitude of challenges on how teacher education be structured and or restructured to respond to the urgent need of teachers to teach children with disabilities enrolled in regular schools. In the next section I will describe teacher education in Tanzania with a view to making the reader aware of the need to further develop strategies to support teachers in implementing inclusive education.

2.4 Teacher education in Tanzania

In 2013 there were 105 (34 government and 71 non-government owned) teacher training colleges for regular teacher education in Tanzania, but only one teacher training college that prepares teachers to support individuals with special needs and disabilities, namely Patandi Teachers College (Tungaraza, 2014, MoEVT, 2013).This shows the low priority given to special needs education in the education system. The capacity of Patandi TC is insufficient (teacher education for special education will be described in Chapter 3). Thus, a large

number of children with disabilities, who are enrolled in schools, are taught by regular teachers (Bagandanshwa, 2004; Karakoski & Ström, 2005; Mboya 1992). Teacher education in countries like Tanzania faces many challenges. These challenges are related to shortages of opportunities for professional development, teaching resources, physical resources and fiscal resources (Levira & Mahenge, 1996; Meena, 2009; Mosha, 2000; 1995; Osaki, 2000b; Rajabu, 2000; Sumra, 2000; UNESCO, 2002; Wepukhulu, 2003). The shortages in professional development opportunities have resulted in many teachers having inadequate classroom managerial skills, lacking skills to facilitate learning in a class with children with different abilities, and shortages of skills in preparing and using teaching and learning resources that could facilitate the learning of all children, including children with disabilities. With challenges in fiscal resources, many schools are unable to purchase material and devices that would support the learning of all children, and schools are also unable to facilitate teachers in attending professional development courses.

Challenges in implementing inclusive education in Tanzania are related to capacity building among teachers, school infrastructures, teaching and learning resources and availability of opportunities for professional development among teachers (Bagandanshwa, 2004; Kapinga, 2012; Miles et al., 2003). There are also challenges associated with the quality of secondary education (Jidamva, 2012) and the quality of teacher education (Chambulila, 2013). The quality of secondary education has adverse effects in teacher education as teachers teaching in primary education are secondary graduates. This consequently affects primary school education. Like other developing countries Tanzania is faced with the challenge of how to prepare teachers to facilitate learning in inclusive classes. Challenges in teacher education pose problems in the implementation of inclusive education, where inadequately prepared tutors prepare teachers to meet the diverse learning needs of children included in regular classes. The problem of under qualified teachers poses a double disadvantage to children with special needs and disabilities. When the teachers are not well prepared they cannot adequately teach average (non-disabled) children and their readiness to teach children with disabilities is even lower.

In the situation where teachers and colleges face challenges in implementing the curriculum the quality of teaching and learning in schools deteriorates (Malekela, 2004) and the learning of individuals with disabilities is adversely affected. The ongoing educational reforms worldwide that require teachers to meet the learning needs of all learners emphasize not only initial teacher education programs of good quality, but also a need for teacher professional development (Chambulila, 2013; Darling-Hammond, 1997; Kapinga, 2012; Naukkarinen, 2010). Designing relevant and realistic teacher education is a prerequisite to the provision of quality teacher education (Chambulila, 2013; Mosha, 2012). Since the Jomtien Declaration (UNESCO, 1990) and Salamanca Statement (UNESCO, 1994) a number of policies have been put in place worldwide that emphasize the importance of enrolling children with disabilities in schools; for example, a child with visual impairment has a right of access to

any part of the curriculum (Sharma, et al., 2010). However, when taking the above mentioned challenges into consideration the situation is not very promising. The issue here is not only about including children with visual impairment in regular classes, but how to make teachers able to cater for their learning needs.

Teachers trained to teach in regular schools seldom have the required skills to teach individuals with visual impairment. Teachers teaching children with disabilities included in regular classes are also required to have positive attitudes and a willingness to adapt their teaching methods. Teaching skills are important to be considered but not the only condition for effective teaching and learning process in classes enrolling children with VI. However, research shows that teacher education is the most important single factor when it comes to quality of education (Forlin, 2004; Forlin, 2010). Teachers are trained, not born (Darling-Hammond, 2000; Maughan, Teeman & Wilson, 2012). Trained and certified teachers are better rated and more successful in teaching than those who enter teaching without any training (Haberman, 1985). In similar ways, inadequately prepared teachers are less competent in planning the curriculum, teaching, managing classrooms and implementing teaching practices.

Good teacher education is a guarantee for quality education, but besides regular teacher education a special teacher education of good quality is also needed (Naukkarinen, 2010). According to Chambulila (2013), there is a need to develop a research-based teacher education. It is through research that teachers are likely to develop skills and knowledge to determine children's needs and to address their needs. In Tanzania, teachers of children with VI are trained either on college level (Patandi TC) or university college/university level (For more explanation, see chapter 3).

According to Kapinga (2012), teacher professional development in special education has not been considered and all educational reforms need to consider issues related to how best to support teachers in developing the skills necessary to teach persons with disabilities. Tanzania is trying to implement inclusive education, where currently few children with disabilities learn in a regular class. Enea Mhando and Basiliana Mrimi (2004) view professional development in Tanzania as being important as teachers and tutors are facing challenges that include having a weak knowledge base about subject and pedagogical content, low teacher motivation, a curriculum based on examinations and school inspectors, an inability to teach overcrowded classes, as well as the existence of a weak linkage between teacher education and schools. This situation existed until 2005 when the first professional development in special education at degree level was introduced at the Open University of Tanzania (Kapinga, 2012).

In this chapter I have described teacher education in Tanzania with a focus on regular teacher education, because it is regular teachers who are supposed to implement inclusive education in regular schools. However, the quality of teacher education is poor. This means that a large proportion of teachers providing educational services to children with disabilities do not have

knowledge and skills about how to support them. This makes the implementation of inclusive education challenging. In the next section I focus on children with visual impairment as I describe the development of education services for children with visual impairment in Tanzania. The aim of this is to give the reader an understanding of the challenges and development needs that this study addresses.

3 Education for children with visual impairment in Tanzania

In this part of the study I discuss education services for children with VI in Tanzania. I start by introducing the reader to issues related to visual impairment: definitions, causes and prevalence. Later, I shortly discuss the development of education services for children with VI. This contributes to understanding of the current situation and the low priority disability issues are facing. Further, this chapter also discusses how the curriculum is implemented in the education of children with VI in inclusive classrooms and schools. On the whole, the chapter intends to give the reader a picture of the need to change teaching practices in schools enrolling children with visual impairment in Tanzania.

3.1 Visual impairment in Tanzania

Definitions of visual impairment

The term visual impairment is conceptualized differently among scholars. For example, Dandona and Dandona (2006) define visual impairment as visual acuity of less than 6/18[9] to 3/60[10]. On the other hand, Salend (2007) views children with visual impairment as those whose vision has an impairment that adversely affects their educational performance. Visual impairments are classified as low vision, functional blindness and total blindness. Functionally blind and totally blind individuals need tactile materials in their learning process. Differently from Dandona and Dandona (2006) and Salend (2006), Smith (2007) has a neurological view of visual impairment. He talks about cortical visual impairment (CVI), which is a relatively new area in the research on visual impairment. Vision loss is seen as an abnormal functioning of the part of the brain where the visual perception is processed. Cortical visual impairment is therefore seen as a neurological disorder. This is a new challenge, as a person with cortical visual impairment has a normal eye function in eye examination and has a normal eye appearance (Smith, 2007). This is an interesting field of

[9] 6/18 means that person with vision problems can only see at six meters what a 'normal' sighted should see at 18 meters.

[10] 3/60 means that person with vision problems can only see at three meters what a 'normal' sighted person should see at 60 meters'. In this case the patient's sight is approximately twenty times poorer than 'normal' or requires detail to be brought twenty times closer before it is seen.

medical research, but not very relevant for the Tanzanian situation, where the educational definitions of visual impairment have more relevance, at least for this study.

Educational classifications of the levels of visual impairment are different from the medical and legal definitions that focus on distance of effective sight. The educational classifications are moderate, severe and profound visual impairment (Chapman & Stone, 1988) based on the special educational adaptations that are necessary to help the individual to learn. A moderate visual impairment can be almost entirely corrected with the help of visual devices, either in the general education classroom or in a resource room. A severe visual impairment is helped only to some extent with visual devices; still the child can use vision as a channel of learning. This classification is equivalent to the definition of a child with partial sight (low vision). Children with a profound visual impairment cannot use vision as an educational tool (Hatlen, 2000). For these children, touch and hearing are the predominant learning channels.

With relevance for educational contexts, visual impairment means defective vision due to physical, biological and/or neurological conditions, with relatively permanent eye problems that adversely affect an individual's participation in socio-economic activities and learning processes (Gilbert & Foster, 2001). According to the above stated definitions, in the context of this study, *visual impairment is regarded as a limitation of an individual's ability to use vision as a channel to access and use information in the teaching and learning process.* These individuals require different support systems in order to learn. Some might require tactile teaching materials, whereas others might require enlargement of text or special seating arrangements in the classroom during the teaching and learning process. Visual impairment affects not only learning. It imposes restrictions on individuals' range of experiences, mobility and ability to control their environment. According to Ayoku (2006), visual impairment results in developmental delay, poor concept formation and learning problems that also affect socio-economic development.

Causes and prevalence of visual impairment in Tanzania

More than 90% of persons with visual impairment live in developing countries and mostly in rural poor areas (Thylefors 1987; WHO, 2007). In rural Tanzania people are faced with a high rate of poverty and do not have access to clean water. Poverty is related to visual impairment and blindness (Polack et al*.,* 2006). Tanzania has not yet developed equitable medical and social services for individuals with disabilities, including visually impaired persons. The lack of developed infrastructure leads to uneven distribution of social and economic services, including health and education. Rural Tanzanians are more vulnerable to shortages of resources such as water and sanitation services compared to urban dwellers. A survey conducted in 2002 by the Ministry of Water and Water Aid revealed that the use of piped water varies to a large extent in the country. Over 80% of the population living in urban centres has access to piped water, while the percentage among the population in rural areas was only between 20% and 25% (URT, 2002). With low economies of scale, Tanzania cannot train large

numbers of competent manpower to support economic growth and social services including health and education. In a country facing such a situation there is a likelihood of increasing incidence of disability.

The causes of visual impairment in Tanzania are mainly originating from different eye diseases. In most cases eye diseases that are likely to cause visual impairment are multifaceted and appear to emanate mostly from high frequencies of trachoma, cataract, glaucoma, vitamin A deficiency, diabetic retinopathy, use of local eye medicine and uncorrected refractive errors (Poole, 2002; Shirima et al., 2009). According to Njuguna et al. (2008), who studied causes of visual impairment among children in schools, the main causes were corneal pathology, cataract and retinopathies. It was also estimated that 40% of severe cases of visual impairment and blindness were due to potentially avoidable causes, such as trachoma[11].

Trachoma is one of the major avoidable diseases that cause blindness worldwide and more so in developing countries like Tanzania (Mariotti, Pascolini & Rose-Nussbaumer, 2009; Mkocha, Munoz & West, 2009). Trachoma is a source of visual impairment in the rural areas in different parts of Tanzania with desert or semi-desert climate like Dodoma and Singida (Frick, Melia, Buhrmann&West, 2001) where there are also shortages of water services. The people living in such areas cannot change the climate, but they can change their own habits. West et al. (1995) assessed the impact of face-washing in a study. The findings showed that families practiced face hygiene had less likelihood of having a child go blind. In another study (Rog et al., 2011) about water and face-washing, in which 173 households (329 children) from trachoma endemic communities in Tanzania were involved, showed similar findings. The findings indicated that hygiene in face-washing could assist in trachoma control. However, hygiene is only one factor. Other causes of visual impairment are associated with health infrastructures due to long distances to health facilities after eye injuries (Al-Attas et al., 2010).

In addition to poverty in rural Tanzania and in rural Singida specifically, disability may be termed as 'adding salt to the wound,' especially in parts of the country where social infrastructures such as health care are scarce. According to a disability survey conducted in 2008 in Tanzania, disability was found among 7.8% of the entire population (Tanzania Mainland). In Zanzibar the prevalence was estimated to be lower, 5.9 % (National Bureau of Statistics [NBS], 2008). Reasons attributed to this difference might be infrastructural challenges and the fact that health problems are bigger in mainland Tanzania.

With reference to disabilities in Tanzania, visual impairment stands high in prevalence compared to other types of disabilities (National Bureau of Statistics [NBS], 2008). According to Table 1, the disability with the highest frequency for

[11] Trachoma is an infectious disease caused by a bacterium called *chlamydia trachomatis*.

persons aged 7 years and above was visual impairment (referred to as seeing) (3.7 per cent).The total prevalence sum is different from the sum of the different types of disabilities for the reason that an individual can have more than one type of disability. If the estimation is correct, it means that there are over 1.6 million people with visual impairment in Tanzania.

Disability prevalence in Tanzania mainland was higher in the rural areas. Regions such as Mara, Tanga and Ruvuma had the highest prevalence of disabilities in the country (between 12.2% and 13.2%) (NBS, 2008).Though Singida Region seemed to have a lower prevalence of visual impairment (7.4%) compared to the above mentioned rural poor regions after awareness campaigns on disability and specifically on blindness started being implemented in 2004 (Singida Region Vision 2020 Report, 2006). Studies indicate that Singida Region, as other rural areas, is faced with many challenges such as shortage of water, shortage of health services, lack of eye specialists, inadequate support services to the few available eye specialists, poverty leading to inability of people to pay costs related to eye treatment, and lack of awareness about different types of blindness (Singida Region Vision 2020 Report, 2006; Lewallen et al., 2008).

Table 1. Percentage of persons with disabilities aged 7 years and above

Type of Disability	Male (%)	Female (%)	Total (%)
Seeing (Visual Impairment)	3.6	3.6	3.7
Hearing	2.0	1.9	1.9
Mobility	2.7	3.4	3.1
Cognition	1.5	1.5	1.5
Communication	0.9	0.7	0.8
Total percentage	7.7	7.8	7.8

Source: Tanzania 2008 Disability Survey Report

Where poverty prevails there is the likelihood of few health and educational services. There are also few opportunities and provisions in terms of human resources including health officials and teachers supporting children with visual impairment and blindness. Due to various factors like diseases and poverty it is very likely that the number of children with visual impairment will continue to increase. This means that many learners will have visual impairment and will need professional support in classrooms, in schools and in society. As visual impairment will continue to exist there is an apparent challenge for schools to develop knowledge and strategies about how to include and give educational support to all these children. Visually impaired persons in developing countries face several problems, including poverty, that hamper their participation in society as they receive few or no social services (Eleweke & Rodda, 2002; Ochieng, 2010; Palmer, 2005). Some of the problems are associated with shortages of accessible and affordable technological solutions, non-availability

of printed materials of accessible formats, limited access to ICT facilities including the internet, inadequate vocational training institutions, lack of employment possibilities and a society with negative attitudes toward integrating persons with visual impairment in society. Of these challenges, the one that seems to be the biggest is the general lack of awareness among the general population and the policy-makers. In the next section I will describe the development of education services for children with visual impairment.

3.2 Education services for children with visual impairment

Provision of education services for children with visual impairment in Tanzania started in the 1950s (Bagandanshwa, 1999, 2004; Karakoski & Ström, 2005; Kapinga 2012; Mnyanyi, 2007a). Historically, all forms of disabilities have had negative consequences for the individuals themselves and for their families. In the past, children born with disabilities were killed or isolated from the main society (Kisanji, 1998; Possi, 1986). Persons with different forms of disabilities, for example visual impairment, are still viewed as useless, parasites, helpless, incompetent, unproductive, dependent, and as such are denied access and participation in different socio-economic and community development aspects (Filmer, 2008; Lee & Park, 2008; Michelle & Asch, 1988; OECD, 1999; Shakespeare, 1997). This is a reality for many persons with VI in Tanzania today.

Education for children with VI aims at helping them to maximize success and overcome difficulties to learn, live and integrate with the entire society (Bagandanshwa, 1999). Nevertheless, this seems difficult to achieve. In providing relevant education for a child with visual impairment, education services have to be modified and adapted to include practical life skills like mobility, self-confidence, sensory exercises, drawing, handicraft, physical education, and mobility training such as the use of white canes and guide dogs. Education is a means by which individuals acquire knowledge, skills and values through learning in order to improve their ability to acquire and use more complex information, thereby deepening their understanding of themselves, their environment and the fast globalizing world.

Acquiring education improves individual development and in the long run national prosperity (Mbelle, 2008; Munishi, 2000; Omari, 1999; Nyerere, 1970). As such, education of good quality is important for all people as education enriches human minds by broadening their experiences and imaginations. Education improves the choices people make as consumers, citizens and members of communities and households (Omari, 1999). It is also acknowledged that education increases productivity and the potential to lead a better life (World Bank, 1991). Unfortunately, in many instances educating children with VI is still seen as a waste of resources. Below I give a brief historical description of the development of education services for pupils with visual impairment.

3.2.1 Development of education services for pupils with visual impairment

According to Kisanji (1998), there were several factors which motivated various countries to provide education services for children with special needs, including those with visual impairment. Among those factors are religious zeal and humanism, financial gain, prestige, and to a lesser extent professionalism. Schools for children with disabilities were established in the second half of the 18th century. In Tanzania, individuals with visual impairment started receiving formal education in the 1950s when Buigiri School for the Blind was established by the Anglican Church Diocese of Central Tanganyika (Bagandanshwa, 1999). This marked the start of a western type of education for the blind in this country. However, the Buigiri School for the Blind in providing education to children with VI was faced with challenges such as financing, staffing, enrolment, a shortage of teaching materials and undefined curriculum content (Bagandanshwa, 1999). Buigiri School started with only 6 students. Different strategies were therefore employed to increase school enrolment. The Anglican Church took responsibility for sensitizing the public to the importance of education for children with VI. As a result, more parents started sending children with visual impairment to Buigiri. Some other church organizations decided to learn from the experiences of Buigiri and started their own schools[12].

The establishment of a few special schools did not open up enough possibilities for all children with VI to get educated. The reasons were that there were only a few schools, the schools did not have enough boarding facilities, and lacked trained teachers. Another reason was poverty among the families with children with visual impairment. Most of the families with children with VI were unable to pay for transport and accommodation costs. Another challenge experienced was related to social integration. The school environment was different from home. Different types of supporting technologies were used in order to promote functionalities for visually impaired children with regard to autonomy, independence, quality of life and social inclusion (Bagandanshwa, 1999). These skills learnt at school were needed to be used at home where family members had no knowledge. Similarly, in the school all children were visually impaired and thus had developed adaptive skills in an environment where all are visually impaired. There was a need, therefore, for children with visual impairment in special schools to learn adaptive skills in an inclusive environment where both sighted and non-sighted persons earn a living.

In order to promote social integration skills, three models for providing education for children with VI were created (Bagandanshwa, 1999). The first was a kind of integration model, where children from special schools were integrated in a regular primary school for some period. In the second model the special school acted as a resource centre and provided services for children with VI enrolled in regular schools. The third model established in the early 1960s,

[12]For example, North-East Diocese of the Lutheran Church established Irente School for the Blind in 1963 in Lushoto, Masasi School for the Blind was established by Masasi Diocese of Anglican Church in 1967 (Kapinga, 2012)

and which still exists, was similar to the second model. Resource rooms were established in regular schools where children with VI were enrolled. Trained special education teachers, specialized in visual impairment, were responsible for the resource rooms.

Enhancing social integration, resource rooms were built in regular primary schools. In each regular school with a resource room a boarding facility for visually impaired persons was built. As discussed earlier, the first resource room was built at Uhuru Mchanganyiko in 1962. In 1967 three schools for children with visual impairment were established in Ikungi (Singida Region), Kabanga (Kigoma Region) and Masasi (Mtwara Region) (Kapinga, 2012). In 1968 a school for learners with visual impairment was opened in Pongwe (Tanga Region). In 1970 another school for children with visual impairment was opened in Hombolo (Dodoma Region) and in 1973 a school for visual impaired learners was opened in Mwanhala (Mwanza Region). In 1984 a presidential commission on education (The Tanzania Education System: 1981-2002) recommended the provision of the same education services for children with disabilities as for non-disabled children (URT, 1984). Later, in 1995 the ministry responsible for education in Tanzania formulated the Tanzania Education Policy that further stressed the provision of education for children with special needs and disabilities (URT, 1995).

The idea of resource rooms was also borrowed by the Tanzania Society for the Blind (TSB).Tanzania society for the blind is providing itinerant services in 10 regions in Tanzania. This means that that less than half of the Tanzania regions are not covered (Mnyone, TSB Director personal Communication). In each area where TSB provide itinerant services created preparatory centre where children with VI learn functional skills before being included in regular school. Functional skills learnt by children with VI include communication skills, simple arithmetic, and daily living skills. These resource rooms have assistive devices, specially trained teachers in visual impairment, visually impaired teachers and support staff. These resource rooms are built in a regular school but do not have a boarding facility. Children in these resource rooms learn Braille skills, simple arithmetic, daily living skills, and communication skills. Resource rooms have been the engine in establishing inclusive education in Tanzania in 1997. Since 1997 enrolment of children with special needs and disabilities took a different form in Tanzania, when regular schools started enrolling children with special needs and disabilities. For visually impaired children the idea of itinerant service by TSB is still being implemented. This has been an engine for education for visually impaired children in Tanzania. The general practice until 2014 was for children with visual impairment to join regular school when in class three. In the early years of education children with visual impairment spent time with special education teachers through itinerary services. Special schools and resource rooms provide support services to teachers in regular schools with visually impaired children. With few resources and the likelihood of irregular attendance

of itinerant teachers, efforts are needed to help regular teachers support visually impaired children in the teaching and learning process.

Overcoming barriers and participation in education for persons with special needs and disabilities in Tanzania need to be addressed both at policy level and in classrooms where children with disabilities are enrolled. At the policy level there is a need to define and provide guidelines as to how children with disabilities should be educated in Tanzania. For visually impaired persons itinerant services have been implemented. At school level a policy on school-based teacher professional development can be adopted and implemented so that teachers create a good learning environment for all children in an authentic situation.

As a step toward social inclusion for persons with disabilities, in 2009 Tanzania created a National Strategy in Inclusive Education (2009- 2017), the objectives of which included ensuring that teaching and learning respond to the diverse needs of learners, that educational support is available to all learners, professional capabilities for inclusive education are widened and strengthened, and that community ownership of and participation in inclusive education are enhanced. The assumptions were that the whole community should be responsible in practicing inclusive education. Questions arising in this strategy are where teachers will be trained, what will happen to teachers without knowledge of inclusive education who are already teaching, what happens to organizations that provide educational support following their donor guidelines, and finally will there be enough resources to ensure all children receive the needed support? With respect to assistive devices for students with disabilities in schools, it is not clearly indicated where funding will be obtained. Communities in Tanzania are experiencing shortages of classrooms, teacher houses and teaching and learning resources. Less is discussed about challenges associated with shortages of assistive devices. On the whole, the idea of having a strategy is good as will establish which evaluation can be made and the necessary changes to be made through a consultative environment.

By 2014, 5 years since the National Inclusive Education Strategy (2009- 2017) started being implemented, Tanzania had 3 special schools for the blind, and 34 units for children with visual impairment attached to regular primary schools. There were also 17 secondary schools for the blind (MoEVT, 2014). In Tanzania in 2014 a total of 268 primary schools and 37 secondary schools were enrolling children with disabilities (see Table 2). The special schools for children with VI are Irente (Tanga), Buigiri (Dodoma), and Furaha (Tabora). Schools providing services under the itinerant services through TSB are not included in the list.

Table 2. Number of schools enrolling children with disabilities

Type of Disability	Available Primary Schools (units)		Available Secondary Schools
	Special Schools	Units	
Visual Impairment	3	34	15
Hearing Impairment	11	38	14
Physical Impairment	2	4	5
Intellectual Impairment	5	155	3
Deaf-blind	8	0	0
Autism	0	8	0
Total	**29**	**239**	**37**

Source: MoEVT 2014 (Special Education Unit).

With support from SENSE International (A global charity organization supporting deaf-blind persons), Tanzania has prepared a primary school curriculum for the deaf-blind. The curriculum is mainly based on life skills, activities of daily living and behaviour modification. Today, Tanzania provides education for children with a variety of impairments, including those with visual impairment, albinism/low vision, hearing impairment, mental retardation, physical disabilities, autism and deaf-blindness. However, there are other disability categories not yet addressed such as learning disabilities (LD), behaviour disorders (BD), multiple and severe disabilities and language, speech and communication disorders. Therefore, more efforts are needed in order to ensure that all types of disabilities are addressed. In this section I have shown the historical development of education for children with disabilities in Tanzania with special focus in children with VI. Other disabilities have been indicated not for the purpose of comparing, but for indicating that problems in inclusion exist in Tanzania: not only for children with VI, but also for other disabilities. In the next section I describe teacher preparation for children with VI in Tanzania with a view to foregrounding the need for school-based professional development.

3.2.2 Teacher education for children with visual impairment

Though education for visually impaired children started in 1950, teacher education did not consider teacher education for children with special needs. In Tanzania education for visually impaired children started without specially trained teachers. It started with individuals supporting visually impaired persons in reading a Bible prepared in Braille print. The first teachers were therefore individuals trained in reading Braille materials. In early 1950 Buigiri School for the Blind decided to recruit teachers through on-the-job training and some teachers were trained abroad. The first individuals recruited as teachers were graduates from Thika School for the Blind in Kenya (Bagandanshwa, 1993, 1999). There were short courses also at Buigiri School (a special school for the blind). The training of the teachers focused on reading Braille and other aspects of education. The intake at Buigiri School for the Blind was limited to three persons, giving only a few teachers access to knowledge on Braille skills.

As many parents were sending children with visual impairment to schools, the need for teachers to support their learning increased. One of the initiatives to increase the number of teachers was through short courses. These short courses for training teachers for visually impaired children started in the 1970s and 1980s at Tabora Teachers College (Bagandanshwa, 2004). With the aim of overcoming barriers to enrolment and participation in education for children with disabilities, the government started a program in the 1970s for the training of special education teachers in Tabora Teachers College. The program at Tabora later was transferred to Patandi Teachers College, where to date training of special education teachers in Tanzania is done.

According to Bagandanshwa (2004) the training of teachers who facilitate learning of children with disabilities in primary schools in Tanzania is provided through in-service training. In-service training is a form of teacher professional development. Teacher professional development refers to work-related learning opportunities for practicing teachers that can take the form of short face-to-face courses, reflections with colleagues, peer and supervisory observation, keeping journals, participating in action research process and conducting classroom research (Feinman-Nemser, 2001; Hamachek, 1999). As a way of improving teacher education, in-service training is required for improving teachers' attitudes and practices (Agbeko, 2007; Anderson, 2000; Craig, Kraft & du Plessis, 1998; Leu, 2005; Mbassa, 2004; Naukkarinen, 2010). Leu stresses that if teachers are to become reflective practitioners and users of active teaching and learning methods, continuous professional development within their teaching context is important.

In Tanzania primary school teachers training in facilitating the learning of individuals with visual impairment is done at Patandi Teacher Training College. The training is done for regular teachers who have practiced teaching for at least two years. It is a form of in-service training. The course lasts for one year. Similar training is done for teachers of the hearing impaired and with intellectual impairment. In2013 the college started enrolling teachers to cater for services to children with deaf-blindness. No department at Patandi is dedicated for children with physical impairments, autism, and those with behavioural challenges.

In implementing inclusive education, teachers started enrolling children with disabilities with poor support services for children with disabilities in regular schools (Mboya & Possi, 1996; Mmbaga, 2002; Kapinga 2012). In most cases it was only a question of placement. Tanzania has no inclusive education policy, but has developed an inclusive education strategy (2009 – 2017) (MoEVT, 2009). As discussed in section 3.2.1, inclusive education strategy in Tanzania stipulates means by which inclusive education is implemented by different types of stakeholders, teachers, non-governmental organizations and the Government. Within the inclusive education strategy emphasis is placed on developing institutional-based educational support. As a starting point all teachers will study a module in inclusive education (MoEVT, 2009). This is one of the strategies to respond to one of the barriers to inclusive education, namely that teacher

education is focused on catering for the needs of non-disabled children. Despite policy level declarations on rights to education for children with VI, the situation has not changed much (Bagandanshwa, 1997, 1999, 2004). Furthermore, in 2004 the Government formulated a disability policy that stressed education as a tool to support persons with special needs and disabilities in order to improve their quality of life, and in 2010 with Disability Act number 9 of 2010 in which the rights to education for all are further stressed.

This is the case also when it comes to teachers for special needs education. In Tanzania there is only one teacher training college, Patandi Teachers College, dedicated for training primary school special needs education teachers, but the capacity of the college is limited (Bagandanshwa, 2004). Patandi TC started training for the Certificate and Diploma in Special Education in three fields, hearing impairment, visual impairment and intellectual impairment. By 2012 the college had plans to increase teacher training in the field of autism, low-vision, physical impairment and deaf-blindness (ROMME, 2012). The challenge with Patandi TC is that teachers are trained using the categorical mode, where teachers specialize in special types of disability. Patandi teachers when posted to schools often find themselves inadequately trained as they are not trained in catering for children with other types of disabilities, thus they require professional development in facilitating the learning of all children.

The shortages of teachers trained in special education, shortages of teaching and learning resources, and society awareness of educating children with disabilities can be attributed to the denial of enrolment of children with disabilities in regular schools (Bagandanshwa, 2004; Eklindh & Nchimbi, 1989; Mboya, 1992). In the schools visited during the joint review of the PEDP it was revealed that schools refused the enrolment of children with disabilities, especially the deaf and those with mental retardation, as the schools lacked the physical facilities and human capacities to handle them (URT, 2004). An inadequate supply of teachers with knowledge and skills in supporting the learning of children with disabilities including those with visual impairment in Tanzania results in children with VI only poorly grasping the learning content (Kapinga, 2012; Mmbaga, 2002; Mwakyeja, 2013).

The creation of university-based special needs education for professionals in Tanzania was started by Åbo Akademi University (offering degree programs in education) in Morogoro TC in 1995. The students were enrolled at Åbo Akademi University and obtained their degrees from the university. Before 1995 university-based special education was only provided abroad. At the University of Dar es Salaam students studying teacher education are required to take a course in special education. The Open University of Tanzania adopted and modified degree programs in special education from Åbo Akademi University and started offering a Bachelor's Degree in Special Education in collaboration with Åbo Akademi University in 2005. Different from Åbo Akademi courses offered at Morogoro Teachers College, the students at the Open University of

Tanzania were required to take special education courses and one teaching subject. Degrees in special education courses in Tanzania are currently offered at the Open University of Tanzania, Sebastian Kolowa Memorial University (SEKOMU) and Dodoma University. SEKOMU started offering a Bachelor's Degree in Special Education in 2007 and Dodoma University started offering a Degree in Special Education in 2008 (Tungaraza, 2014).

There are challenges facing teachers in implementing inclusive education that include a general lack of awareness about disability, low priority given to children with disabilities, a shortage of professional development opportunities, shortage of necessary skills to implement teaching in inclusive classes, under-resourced regular schools and classrooms, shortage of assistive special devices (e.g. Braille, large print, thermo form), and large class sizes (Arbeiter & Hartley, 2002; Buhere & Ochieng, 2013).Where teachers are not aware of the disability they are likely to use inappropriate teaching techniques. It is also likely such teachers are unable to improvise, prepare and use learning materials (Arbeiter & Hartley, 2002; Ferguson, 2000; Westwood & Graham, 2003). In Tanzania, a study conducted by Tungaraza (2014) identified the challenges facing teacher training for special needs education to be an inadequate number of trained teachers in special needs education, inadequate training of teachers, teacher dropout, lack of/inadequate teaching and learning materials, negative attitudes, curriculum and evaluation procedures, barriers to information accessibility, and lack of cooperation with other professionals. These challenges are likely to be a result of lack and/or shortages of training in inclusive education. According to Rose and Howley (2007), schools are likely to build an inclusive education culture when teachers are equipped with knowledge and skills to meet the learning needs of all children enrolled in their classes.

3.3 Curriculum implementation in education of children with VI

In previous studies it has been indicated that the curriculum in special education is centred on physical (motor and sensory), intellectual (speech and academic), and moral (socialization) training (Algozzine & Ysseldyke, 1992; Karge, 1998; Talbot, 1964). A curriculum is a plan or program of all experiences which the learner encounters under the direction of a school (Tanner and Tanner, 1995). According to Gatawa (1990), it is the totality of the experience of children for which schools are responsible. Therefore, a curriculum refers to a course of study or plan that provides learning opportunities in the form of knowledge, skills, attitudes and beliefs with the purpose of bringing about changes and reinforcing already acquired behaviours in the learner.

In Tanzania the curriculum for basic education, secondary education and college-based teacher education managed by the MOEVT is centrally set by the

Tanzania Institute of Education (TIE) and centrally tested by the National Examination Council of Tanzania (NECTA). This centralized curriculum should be followed by all learners, including those with disabilities. In order to promote learning and participation in implementing the school curriculum for children with VI, adapted means of communication such as Braille, typewriters, adapted teaching materials, and computers can be used (Corn & Koenig, 2002; Heinze, 1986; Koenig & Holbrook, 1992). This calls for education providers, policy-makers, politicians, parents, teachers and supporting agents like civil society and non-governmental organizations to facilitate the acquisition and proper use of assistive technologies. Teachers are the agents of change and thus require skills in adapting and using the means of communication that enhance learning. In implementing inclusive education in all schools teachers need skills to teach individuals with special needs, including those with visual impairment.

Implementing inclusive education requires teachers to learn the general and the extended curriculum (curriculum for vision-related skills). Teachers have to learn the extended curriculum so that they develop skills that enable them to facilitate children in concept development, organizational skills, speaking and listening, and communication skills such as the use of Braille machines (Brown, 2012; Carroll, Forlin & Jobling, 2003; Kristensen, Omagor-Loican, & Onen, 2003).Whereas the new curriculum started being implemented in 2005, the teacher education curriculum with a component on inclusive education started only in 2009 (URT, 2008) and the first cohort of teachers graduated in 2011 (NECTA, 2011). However, neither teacher education nor the basic education school curriculum takes on board the special needs of learners with disabilities. As a result of this, most of the teachers are not trained in providing services to individuals with disabilities. Whereas sighted individuals start schooling with a well-established curriculum in Tanzania, this is not the case for individuals with VI who start school without a suitable curriculum and without teachers with adequate knowledge and skills of how to adapt the curriculum in order to facilitate their learning.

Ever since the 1950s when the education for the blind started there was a discussion about the curriculum: should the general curriculum be used or should there be a special curriculum for individuals with visual impairment. At the Buigiri School for the Blind the decision was made to adopt the general curriculum but to include Christianity and vocational training. Christianity was for teaching moral values among visually impaired children and vocational training was meant to prepare visually impaired youths for making a living. The general curriculum was meant to prepare visually impaired youths for further education and general life skills. In the implementation of the regular curriculum for individuals with visual impairment the challenge of learning materials arose. Teachers needed skills to adapt, prepare and use learning materials for the regular curriculum, Christianity studies and vocational studies. This problem was solved mainly through three ways: collaboration with other institutions (in

this case, Thika School for the Blind and Buigiri School for the Blind), donations and the use of in-house expertise (Bagandanshwa, 1999).

Though the teaching of children with disabilities is implemented in regular and special schools in Tanzania, the issue of the curriculum has not been adequately addressed. Nothing is said about accessing the curriculum for the blind, including orientation, mobility and other support services for children with VI (Mnyanyi, 2009). Implementing the curriculum to visually impaired persons requires well-prepared teachers for teaching the curriculum, the use of assistive special technologies, availability of teaching materials, and teacher innovation in preparing teaching and learning materials (Possi, 1986; Stockley, 1994; Grönlund, Lim, &Larsson, 2010). The use of inappropriate teaching strategies in implementing the curriculum results in a drop-out risk for some children. Where teachers are able to support individuals with visual impairment in their learning they perform like their sighted peers (Koenig & Bachman, 2004; McDonnell et al., 1997). However, no studies about the academic performance of pupils with visual impairment have been conducted in Tanzania, though the examination results reveal that pupils with VI are not performing very well.

Some of the challenges faced by teachers of visually impaired children in Tanzania have their roots in the curriculum assessment system (Malekela, 2004). Experience indicates that teachers put emphasis on syllabus completion in order to prepare children for examinations. Since the teachers' interest is for children to pass examinations, they tend to choose teaching methods which are less time-consuming, less interactive and do not foster critical thinking or self-reflection on the part of the learners (Cooksey & Riedmiller, 1997; Mahenge, 2004; Malekela, 2004). Such teaching methods focus on facts and figures presented in the curriculum. The use of non-interactive teaching methods in classes is associated with shortages of teachers, shortages of school infrastructures, inadequate knowledge and skills to support learners including individuals with special needs and disabilities, and shortages of teaching materials, including appropriate text and reference books (Malmberg, Wanner, Sumra & Little, 2001).

With lack of knowledge in implementing curriculum for children with VI teachers are less likely to accept children with visual impairment, principally for three reasons. The first reason relies on the teachers' personal expectations (Arter, MCall, Mason, McLinden & Stones, 1999; Davis & Hopwood, 2002). The teachers expect the child to require more than they can provide. In Tanzania teachers are assumed to take responsibility for meeting the learners' needs during the teaching process. Thus, in a situation where teachers are to take full responsibilities in facilitating learning in inclusive classrooms they need to be well supported in terms of teaching and learning resources, knowledge and the skills needed to facilitate the learning of all children. In a centralized education system like the Tanzanian one, where all children are subjected to similar

national examinations and where the school ranking is based on the children's performance, the possibility of the teacher leaving a child with visual impairment unattended in a regular class might be common.

The second reason is that teachers teaching children with visual impairment require skills to use the extended curriculum. In teacher education such skills that focus on supporting learners with disabilities in accessing the curriculum are not taught. Such an extended curriculum includes training teachers in the use of Braille, use of tactile learning resources, use of residual sight, listening skills, and mobility training (Davis & Hopwood, 2002). In most cases such technological knowledge and skills are lacking amongst most teachers. Lastly is the issue of inclusion practices. In this case teachers feel they have two different roles: as general teachers and as individuals without knowledge and skills in facilitating children with disabilities. Teachers have to meet the learning needs of sighted children as well as children with visual impairment (McLinden, 1990).

In western countries a special education teacher has the role of adapting the curriculum, assessing the child with disabilities, preparing resources for the child, and teaching basic skills before the child is included in a regular school (Giangreco, et al., 1993). In Tanzania children with VI are included in regular classes after three years. On the other hand, an itinerant teacher in Tanzania has the same roles as special education teachers. The itinerant teacher is responsible for supporting the learning of children with VI, the teachers and school community members, including the parents. Itinerant teachers visit schools to support regular teachers and children with VI enrolled in regular schools. Apart from the itinerant services in schools in some cases the consultant model is indirectly supporting children with disabilities by supporting teachers who implement the curriculum (Brown, Pryzwansky & Schulte, 2011; Conoley & Conoley 2010). The challenges associated with itinerant teachers are that resources are insufficient.

In Tanzania a new curriculum was introduced in 2005. In the new curriculum three subjects were introduced: French, *TEHAMA* [13](ICT) and *Haiba na Michezo* (Personality and Sports). Like all other schools, schools enrolling children with VI implemented the curriculum without having teachers qualified to teach the new subjects. The implementation of the new curriculum was also made difficult as no educational adaptations for pupils with special needs were available.

[13] TEHAMA stands for Teknolojia ya Habari na Mawasiliano which means Information and communication Technologies

4 Teachers' practices in teaching children with visual impairment

In this section I review literature on teachers' practices in teaching children with VI. Teachers' practices are said to be one of the ways of looking at teacher quality, besides teacher qualifications, teacher characteristics and teacher effectiveness (Goe, 2007). Teachers' practices focus on how teachers can influence the learning of children with VI included in regular classes. As a process toward impacting learning, teacher practices are related to practices both inside and outside the classroom. Teacher practices include planning, instructional delivery, and classroom management and teacher interaction with learners. In a class where learners with different types of special needs and disabilities are included, teachers need to have knowledge and skills in meeting the needs of each of the learners, regardless of the type of disability. Below I discuss the learning needs of children with VI, teachers' knowledge and skills and teachers' classroom practices in relation to pupils with visual impairment.

4.1 Learning needs of children with visual impairment

Children with VI need assistive technology in order to have meaningful participation and learning in schools. According to Alves, Monteiro, Rabello, Gasparetto and Karvalho (2009), assistive technology refers to the field of knowledge about products, resources, methodologies, strategies, practices, and services aimed at promoting functionality for visually impaired persons with regard to autonomy, independence, quality of life, and social inclusion. There are two types of visual impairment: those with low vision and those with total blindness. Both have needs that need to be addressed differently, children with low vision can use residual vision and those with total blindness use vision substitution skills.

For effective teaching and learning for children with visual impairment enrolled in regular primary schools in Tanzania, the conditions for the teaching and learning process need to be explored. Such conditions are necessary, as both teachers and children need to learn from each other (Brown, 2012; Chou, 2010; Darling-Hammond, 2011; Fean, 2012; Gordon, 2008). Whereas teachers need to learn how to facilitate the learning of children with visual impairment, children with VI need the teachers' support for their learning. These conditions may include the availability of qualified teachers, teachers' knowledge and skills, adequate teaching materials, appropriate curricular content, use of child-centred

teaching methods and knowledge and skills in using assistive special technologies for both teachers and learners. If these conditions can be met, pupils with VI can learn according to their potential. However, such conditions are not met in Tanzania.

In this section I address the learning needs of children with VI. Children with VI have basically the same learning needs as their sighted peers, but due to their disability they need educational adaptations: vision links and coordinates information received through other senses. It is estimated that about 80% of the information in the environment in which we live is acquired by means of sight (Moore, 2000; Willetts, 1997). In the digital age, both sighted and visually impaired individuals need to develop the ability to read and write. Information to visually impaired persons is becoming accessible through electronic gadgets for listening, but this cannot replace Braille. Literacy involves, among other things, creating, communicating, computing and using printed and written materials. This being the case, listening is not enough to attain literacy. Visually impaired persons also need to develop skills in creating texts for themselves and for others to use. Literacy education that includes reading and writing is important to consider in educating children with VI. Both teachers and children with VI need skills that will impart knowledge in communicating and interacting in a literate world.

According to McLinden and McCall (2002), visual impairment restricts both the quantity and quality of information available to the child, resulting in reduced opportunity to acquire accurate information through vision. In comparison with their sighted peers, children with VI have limited opportunities to explore their environment, learn through experiences and to refine their motor skills by adapting through observing others (Brown, 2012; Dakwa, 2014; McCall, 1999). As a result, children with VI have reduced opportunities in understanding the world around them in terms of how it is organized and how it can be acted upon. They have fewer opportunities to learn how adults respond to certain types of behaviours, observing how others are doing, and thus for them to learn requires more time in order to increase their chances to experience a world using their remaining senses: hearing, smelling, tasting and touching (Méndez, Lacasa & Matuso, 2008; Sawchuk, Duarte & Elhammoumi, 2006).

Children with visual impairment have special requirements if they are to succeed in the general and the expanded curriculum, which is implemented in schools (Hatlen, 1996; Pugh & Erin, 1999). In the Tanzanian context, expanded curriculum includes orientation, mobility, use of assistive devices, interaction skills, self-determination and visual efficiency skills. However, the expanded curriculum is not taught in initial teacher preparation courses. For children with VI who get a chance to join formal education in Tanzania, these skills are taught in early years in special schools and in some resource rooms before the pupils are included in regular classes. Children with visual impairment start being included in general classroom when they start class 4. From class 4 children with

VI study according to the general curriculum and they are supposed to have learnt the required adaptive vision-related skills through the itinerant teachers' services provided in the available resource rooms. These vision-related skills refer, for example, study and organizational skills, speaking and listening skills, orientation and mobility skills, social interaction skills, independent living and personal management skills and skills for effective use and handling of assistive devices and adaptations necessary for accessing all areas of the existing general curriculum (Bagandanshwa, 1999; Dakwa, 2014).

The general curriculum emphasizes knowledge and skills related to academic subjects, and the children with VI are supposed to learn these in the same way and in the same pace as their sighted peers (Bagandanshwa, 1999). No adaptations are given to pupils with VI in the examinations. The idea is that pupils with VI access the general curriculum with skills they have learnt through the expanded curriculum. However, the possibilities for pupils with VI to study according to the general curriculum are limited because of lack of resources. For instance, assistive devices and technologies are rare in Tanzania and depend on donor-funded projects and through international NGOs (Kapinga, 2012; Dakwa, 2014).

The lack of assistive devices and technologies in schools is a fact in most schools, a fact that cannot be changed. The schools and teachers have to rely on the available resources, keeping in mind that children with VI learn primarily through hearing and touch. The teachers are in here a key position. Like sighted children, children with VI require teachers with teaching skills, classroom management skills and skills to create a good classroom environment. These factors are said to be important in enhancing learning outcomes for all children (McBer, 2000; Karakoski & Ström, 2005).

Tanzania, like other developing countries, faces a challenge in supporting the learning of children with VI. For example, the lack of printed material in Braille is a big problem. In Tanzania there is only one printing press, with few staff. The printing press worked well when the government prepared all the school books. In the current situation, where books are published by private companies, the challenge is that not all printers allow their books to be translated in Braille due to copyright issues. With this experience schools enrolling children with visual impairment face challenges of having no supply of Braille books. Very few teachers have the knowledge and skills to read and translate Braille texts. As a consequence, children with VI face many difficulties. They have no books, few materials printed in Braille and no or very few assistive devices. If they have access to a Braille machine for exercises, there is no feedback because teachers do not know how to read Braille and there is not always an itinerant teacher who can support. Very few teachers also have the knowledge of how to adapt and modify teaching methods, prepare teaching resources and prepare and use individualized educational plans (IEP). IEP provides an opportunity for teachers,

children and other stakeholders to work together to provide a program that will foster children achievement and success.

An IEP is a plan set by both the teachers, parents, doctors and other community members who have a role to play in children's learning so that it is implemented in order to support the teaching and learning process. In Tanzania the practice is used by SENSE international, an organization that facilitates teaching and learning for deaf-blind children, where before the long vacation parents and/or guardians stay one week in the school, learning the children's activities, and later during the vacation a teacher visits the family and stays for five days, implementing the planned IEP. This enables children to continue learning both at school and at home. A lack of the necessary skills that facilitate learning indicates that pupils with disabilities are in a challenging situation where learning is concerned, and that schools on the whole face challenges in implementing inclusive education (Abosi, 2000; Dakwa, 2014; Mmbaga, 2002; Mwakyeja, 2013; Zindi, 1997). As long as this situation prevails, inclusion is merely a physical placement, not inclusion according to the proper meaning of the term inclusion.

4.2 Teachers' knowledge and skills

Teachers are builders of bridges between known and the unknown. Successful teachers are the ones who possess skills to support learners to learn at the right time, rapidly and well. According to Miller (1990) teachers, in order to teach well require technical competency (the knowledge and skills on how to teach), professional competency (knowledge of instructional planning, execution and evaluation) and personal competency (personal characteristics and behaviours that impact the teaching-learning process).

Teaching skills are the ways in which teachers carry out activities that ultimately support children's learning. Teaching skills depend on compensatory skills which are referred to the use of tools and devices, adaptations and modifications that create an opportunity for the child to access the environment (Greene, 2006; Wiazowski, 2009). Teachers do facilitate learners in meeting their learning needs and thus need to develop knowledge and skills to facilitate the learning of all children included in their classes. Teacher knowledge and skills need to be constantly developed so that they do not become obsolete. Developing teachers' ability to effectively teach is one of the strategies in school improvement and enhancing the learning of children with VI enrolled in regular schools. The focus in school improvement is toward ensuring access, equity and quality of education provision leading to the children's expected learning outcomes.

Teachers teaching children with disabilities are required to learn disability-specific skills, the expanded curriculum, and general curriculum for visually impaired pupils. These skills are referred to as vision-related skills (Naish, Bell & Clunies-Ross, 2004; Summers, Leigh, & Arnold, 2006).Vision-related skills

are, for example, using Braille machines, learning to move around (orientation and mobility skills), daily living skills, communication skills, and using assistive technologies like Braille reading and ICT. Teacher education has to impart the expanded curriculum and vision-related skills to teachers of children with VI. In special education teacher training (specialization in visual impairment), student teachers learn these skills. However, resources are scarce in colleges and that not many teachers do benefit. Teachers who manage to get chance to be trained the do learn basic skills: how to read and write in Braille and how to teach skills related to mobility. The problem is that there are not enough teachers specialized in visual impairment who can teach these basic skills to visually impaired children.

The curriculum for teacher education is very subject and methodology centred (TIE, 2013) and does not take the diversity of learners into account. On the whole, teacher education in Tanzania does not respond to inclusive education challenges. It has not addressed the issues of, for instance, the expanded curriculum, which is important for children with VI when they start to learn different subjects according to the general curriculum. It is likely that teachers will continue to face problems in teaching children with disabilities included in regular schools.

The quality of teacher education in Tanzania has been considered poor (Chambulila, 2013; MoEVT, 2012; Omari, 2014). The initial teacher education is faced with a multitude of challenges, which results in poorly qualified teachers who have very limited or no competence in teaching children with VI. Heyman, Winicki, Kamingira and Zembeni (2003) indicated that teacher skills and qualifications influenced learner outcome. Very few Tanzanian teachers possess proper vision-related skills, which probably negatively affects the learning of children with VI. The teachers have no tools to support the learning of children with VI. For improving learner outcomes the focus needs to be on developing teachers' knowledge and skills about how to implement teaching in the classroom. Teachers need to continuously improve their knowledge and skills in order to motivate children so that they can experience the excitement and joy of learning. In inclusive education, where all children, including those with special needs, are placed in a regular class, teacher practices count more. Teachers should have skills to diversify class activities according to the learners' needs (Rossi & Stuart, 2007; Taylor & Pettit, 2007). The challenge is how to identify the learning needs of each learner and how to prepare activities related to their needs. In a low income country like Tanzania, this is a big challenge.

Studies by Mmbaga (2002), Mwakyeja (2013) and Kapinga (2012) indicate that teachers in Tanzania lack knowledge and skills in supporting children with disabilities enrolled in their classes, since they are prepared to teach general education students. Mmbaga (2002) found that children with disabilities were left without any support in inclusive classrooms. Mwakyeja (2013) whose study was about teaching children with VI enrolled in one secondary school in

Tanzania revealed that the teachers had little knowledge about inclusive education. They lacked skills to prepare teaching resources and to adapt the curriculum using assistive devices. Therefore, for inclusive education to become reality teachers need to be trained in how to facilitate the learning of all children. However, with a teacher education which does not equip teachers with the necessary qualifications, inclusive education is not easy to implement (Kapinga 2012; Mwakyeja, 2013). Nevertheless, insufficient special education teacher education, poor regular teacher education, unqualified teachers lacking vision-related skills is a fact that has to be dealt in some way. How to improve the situation within the existing frame factors and resources is a question that needs to be addressed.

4.3 Teachers' practices

For ensuring the participation of all learners in a class with diverse learners, teachers' practices need to be organised in forms which allow access to education (Norwich & Kelly, 2004; Thomson, 2008). For Children to experience the learning teachers need to ensure that they have an active role to play in the school. In the case of children with disabilities, their voices are important (Borg, Karlsson, Kim & McCormack, 2012; Fanelli & Mushunje, 2007; Koster, Nakken, Pijl & van Houten, 2009; Naukkarinen, 2000). As the learners are part of the school context, there is a need to develop knowledge and skills among practitioners to access children's views in an ethical and professional way within the school context (Whyte, 2006). This would probably promote the inclusion of all learners. Teachers' practices are activities that teachers constantly exhibit when teaching in a class. These behaviours include involving all children in the lesson, providing appropriate learning activities for each learner in the class, the ability to use a variety of teaching approaches, methods and strategies, using recommended teaching methods for the national curriculum, and the ability to use different questioning and probing techniques (Coe, Aloisi, Higgins & Major, 2014; McBer, 2000; Sammons, Kingston, Lindorff-Vijayendran & Ortega, 2014).

Teaching practice refers to the social actions and activities performed by a teacher in order to facilitate learning. Teachers' skills and competences in planning teacher actions and activities are developed through teacher training, pre-service and in-service teacher education (Makuwa, 2011; Ruiz-Primo & Furtak, 2006; Shulman, 2004; Smith, Polloway, Patton & Dowdy, 2008). Teachers' practices are linked to teacher knowledge and skills about how to interpret the curriculum, prepare a lesson and how to teach. Pre-service teacher training equips teachers with in-depth understanding of the school subjects they are required to teach and the pedagogical skills necessary to support learning at different grade levels in school (Makuwa, 2011).

Teachers' practices involve activities related to different teaching methods, lesson preparation, assessment of children's achievements, reflections about the teaching process and strategies to facilitate learning in the classroom. Teachers' practices in inclusive classrooms are complex in the sense that the teacher needs to meet the learning needs of diverse learners. For example, in a class including children with VI teachers' practices include preparing, using and evaluating inclusive learning resources that are used to facilitate the learning of all children. An all-inclusive learning resource is one that can be used by all children in enhancing their learning. I use this term to mean, for example, a teaching aid that has illustration written both in Braille print and regular print and with distinct colours. Such a teaching resource can be used by sighted children, children with low vision and children with blindness. Similarly, such teaching materials can be used by a physically impaired child and mentally retarded child. This, then, makes such a learning resource part of all-inclusive teaching materials. Thus, it is the responsibility of the teacher to use strategies that are likely to develop the individual learner's capacity to learn. This poses a challenge to the teacher's capacity to handle diverse learners included in regular schools, as diversity in education for a long period has not been considered in teacher preparation programs (Howard & Aleman, 2008). This is also the case in Tanzania, where teachers are not well prepared for teaching in inclusive classrooms.

What does the curriculum say about teaching methods? The curriculum describes what a learner should learn, whereas teaching methods describe how educators present the curriculum materials. The question of what the curriculum says about teaching methods can be addressed in two scenarios, implementing a curriculum to children with special needs and disabilities, and linking teacher practices to the curriculum being implemented. The first scenario is describing teaching methods is when implementing a curriculum to learners with special needs and disabilities. In this case a curriculum is seen in different ways depending on the placement of the user of the curriculum and the environment in which the teaching is taking place. For children with disabilities we have four scenarios. A curriculum can be presented to learners in a special school, where only students with specific disability like visual impairment are taught. Students with disabilities might also be taught in a school with a resource room, where the student is partly with other non-disabled children and later goes to the resource room for enhancing learning. There are also options for children with disabilities to be educated in an inclusive classroom with necessary support and/or learn in a regular school with little or no support at all (McGregor & Vogelsberg, 1998). In all cases the curriculum sets the objectives and levels of achievement in order to support the teacher in planning and implementing the teaching.

The second scenario is when teacher practices are linked to the curriculum. At international level the relationship between curriculum and teaching methods is that the curriculum sets out what is to be taught and the teaching methods are about how that content may be taught. Such knowledge links teaching practices resulting from the teaching methods and the curriculum which is linked to

teacher initial preparation and teacher professional development (Brown, 2011; Morewood, 2007; Morewood, Ankrum & Bean, 2009; Shulman, 1986). In the US the question is how to prepare teachers who would teach all children equitably (Brown, 2010). This calls for teacher capacity building with a focus on developing the teachers' knowledge of content, pedagogy, and curriculum that will inform the teachers' practices. Knowledge of content means teachers will need to be trained in the content they will later teach, whereas knowledge of pedagogy is about how teachers will deliver the content as prescribed in the curriculum (Morewood, 2007; Shulman, 1986). Other countries like Finland have resolved the relation between curriculum and teaching methods by deciding their teacher education will be research-based so that the teacher will do research to determine which teaching method is appropriate to which group of children (Eklund, 2010; Jakku-Sihvonen & Niemi, 2006). In Finland teacher education has been linked to university education since the 1970s in calling for teachers to be researchers of their own teaching (Chambulila, 2013; Eklund, 2010). It can be said that what is to be taught and how to teach forms teachers' practices and is an international agenda.

In Tanzania teacher education is two-fold: university based and non-university based. A large number of teachers are non-university based: those having certificates and those with a diploma in teacher education (Chambulila, 2013; Meena, 2009). Research is not given much emphasis in the teacher education. In both university-based and non-university based teacher education the relationship between curriculum and teaching methods is emphasized. Teachers are taught how to plan for teaching. In the case of teachers' practices, the situation is well explained by Mahenge (2004), who in a study on creating an environment of critical thinking in classroom teaching and learning, reported teachers writing notes on the chalkboard for learners to copy so that they would later reproduce them as answers in the tests and examinations. There were also cases of teachers providing lesson notes and asking one of the learners to do the writing on the chalkboard for other children to copy. The situation of asking a child to copy notes for other children means that teachers do not provide explanations and there is a risk of pupils making mistakes during the copying process. Rarely are the lesson notes copied by children checked by the subject teachers. The copying of subject teachers' notes was a result of shortages of textbooks in schools. Studies and reports with regard to textbooks in Tanzania, including those of Brunswic and Hajjar (1991), Chonjo, (1994), Grahm and Pehrsson, (2004), and SACMEQ III (2010) indicate the textbook situation to be generally bad, but even more serious in rural schools in Tanzania.

Textbooks support teachers in using a number of different teaching strategies, including giving children a reading assignment. With a lack of textbooks children's learning depends on teachers using the so-called talk and chalk method. The talk and chalk method is not suitable for children with VI as it depends only on vision. This kind of teacher-centred approach is unlikely to meet the learning needs of all children, especially not children with VI as they

are not given any chance to learn if they cannot use those learning channels that work for them. There is a big risk that the children become passive and do not learn according to their learning potential. This was clearly shown in a study by Mmbaga (2002). As I have stated above, teaching in Tanzania is associated with the use of visual teaching resources and the blackboard. This is a result of the lack of teaching resources and teacher education where teachers are trained to teach children without disabilities.

In Tanzania, where teaching methods are based on chalk and talk, there is less classroom interaction. The seating arrangements in the classroom are those suitable for the teaching method used, with all children sitting facing the chalk-board with no room for classroom interactions. With shortages of resources, including textbooks, few questions are raised from the children and few assignments are given to children as homework or class work. In Tanzania there are shortages of teachers and thus the few teachers in schools, especially in rural areas, are faced with too large a teacher workload and large class sizes (Rajani & Sumra, 2003; Sumra, 2004; Davidson, 2007).

Changing teachers' practices is not a new phenomenon in Tanzania. There have been, for example, short courses leading to encouraging teachers to use learner-centred methods. The Ministry of Education and Vocational Training introduced the learner-centred Approach in 1997. However, studies indicate that few teachers, if any, have applied learner-centred approaches (Meena, 2009; Msonde, 2011). The reasons for not using learner-centred approaches have been large class sizes, insufficient teaching resources, little opportunity for in-service training and inadequate initial teacher preparation (Chediel, 2004; Kalugula, 2004; Msonde, 2009). However, it should be noted that these teachers were taught the use of a learner-centred approach outside their real teaching environment. The artificial environment created during teacher in-service training was not fruitful. This is attributed to the environment in which teachers learn and the environment in which teachers apply the learnt skills. Challenges with in using a learner-centred approach are found also in other countries like Namibia, South Africa, Bangladesh and Turkey (Msonde, 2011).

Teachers' practices in classes enrolling children with VI also call for changes in teacher education and in-service training in Tanzania. There are changes in the education system that have not kept pace with the changes in teacher education, for example the increasing number of children with disabilities that are enrolled in regular schools that require teachers to be trained in how to facilitate their learning. In Tanzania the need for teachers to change practices in classes enrolling children with VI is obvious.

According to Cochran-Smith and Lytle (2001), there are three ways used in developing teachers in terms of making changes in their teaching practices. They include developing knowledge-for-practice, knowledge-in-practice and knowledge-of-practice. Knowledge-for-practice is generated by outside researchers or groups of individuals and transmitted to teachers for use in

improving educational practices. Knowledge-in-practice is the knowledge that is gained during practical actions in the teaching and learning process; this knowledge provides opportunities for teachers to reflect on their practice, and the reflective knowledge gained is referred to as knowledge-of-practice.

In chapters 2 to 4 I have discussed about the context of the study, education for children with visual impairment, teacher education and teacher practices. In both cases there is a mismatch between what teachers learn in initial teacher education and teacher professional development and the way they teach in their classes. The situation brought forward during initial teacher preparation is different from that which teachers face when posted to their workplaces. Findings from top-performing schools have indicated that children's learning improves when teachers' learning happens in the classroom, teacher leadership receives the support needed, and teachers have opportunities to learn from each other (Friesen, 2009; McKinsley, 2007). Such findings cannot be accepted entirely without critique as teachers in whatever way will need to have some form of professional orientation so that they gain some knowledge. However, there is a question about where teachers learn. Some would simply say they learn in teachers' training colleges. This might be correct or not correct in some ways. It is correct because teachers are certified through teacher education colleges. But it is not correct in that what teachers face in the real classroom is not what was taught in the college classroom. For example, in Tanzania teachers are not taught how to teach children with disabilities and they are not taught about the extended/ expanded curriculum for children with different types of disabilities, whereas when posted to schools they teach classes that include children with disabilities. That means teachers start learning how to accommodate children with disabilities included in their classes in their workplaces. Some teachers learn through experience, but not necessarily all. The workload in overcrowded classrooms is big and sometimes probably too big for some of the teachers who are struggling alone in their classes. In order to help the teachers to cope with the situation, they need some kind of professional development that focuses on the practices in the classrooms.

In the next section I describe how action research can be a tool to support change in teachers' practices. Action research is not the only way to support change: other methods for professional development can be for instance seminars, workshops, short course training and further college training. However, these traditional forms of courses have not always led to sustainable changes. I decided to use action research as it encourages teachers to perform small-scale research in the classroom and use the results to improve their teaching. Furthermore, action research is collaborative in nature and therefore can give teachers the opportunity to learn from each other within the school context.

5 Action research as a tool for change in education

In this chapter I discuss action research as a tool for change in education. I first introduce action research and the factors which lead to choosing action research. I then discuss action research as "change agent" for teachers' practices. Later in the chapter I describe examples of how action research is used in special education and end my discussion with the relation between action research and school based professional development. Finally, I describe how action research can encourage collaboration as a means to facilitate learning and to improve children's achievements.

5.1 Characteristics of action research

Research focusing on improving classroom practitioners' practices is believed to have started in 1929 with Dewey's idea that children's motives and problems are central for all teaching situations (Lunenberg, Ponte & Van de Ven, 2007). Dewey believed in a research design that finds answers to practical questions by involving people who are directly involved in the context in question and in the situation to be changed (Zuber-Skerritt & Farquhar, 2002). It is believed that teachers who are involved in research focusing on improving their classroom practices in a collaborative learning environment that involves continuous analysis of their practices are able to create interventions and make evaluations which improve their practice and their pupils' achievement (Hatfield, 2006; Fullan, 2001; Joyce & Showers, 2002). Research where participants are facilitated by external researchers and play an active role in solving their problems in their day-to-day practice is termed *collaborative action research* (Mitchell, Reilly & Logue, 2009). This type of research is likely to bring about change within the context in which the practitioners practice.

Action research is, according to Mattsson and Kemmis (2007), undertaken with a view to changing practice or praxis. In a broader sense, action research is placed in a group of praxis-related research, which is an approach concerned with addressing and overcoming human suffering, injustice and oppression (Mattsson & Kemmis, 2007). In this sense action research belongs to the critical theory research approach as it advocates change (Kemmis & MacTaggart, 2007). Critical research involves the co-creation of the research agenda by the researcher and researched participants (MacCabe & Holmes, 2009; Nkoane, 2010). In other words, researcher and research participants work together as co-researchers to develop understanding and knowledge about the nature of the

phenomenon or situation which is studied in order to design strategies for supporting change (Nkoane, 2012; Larrotta & Yamamura, 2011). Critical research advocates closeness between the researchers and the research participants (Stjernström, Lund & Olin, 2006; Kemmis, 2001; Mattsson & Kemmis, 2007).

Praxis-related research, or in this study action research, is conducted in a particular context and involves particular persons in an interactive process where the researcher becomes part of the context and the relations created gives opportunity to gain knowledge within it. In praxis-research practitioners and the researcher might operate in different fields and try to understand each other. In this sense, there is a creation of uncertainty situation calling for creation of a communicative space, an opportunity for a mutual exchange of experiences (Habermas, 1974; Mattsson & Kemmis, 2007). Action research facilitates participants to improve their social, political, and economic actions through a systematic procedure of identifying a problem, planning, implementing, observing and reflecting with the aim of further improving the planned social action (Armstrong & Moore, 2004; Mumba, 2005; Polat & Kisanji, 2009;Reason, 2006; Rönnerman, 2008). Through this process teachers, like other actors in social practices, are empowered in improving their teaching practices. Action research is also about improving practices based on interpreting human experiences in teachers' authentic work settings with the purpose of understanding their existing practices and facilitating them to change for the better (Ferrance, 2000; Sagor, 2004). In action research there is sharing responsibility for project outcomes, as well as for the processes of learning and team building (Boud & Lee, 2005; Zuber-Skerrit, 2004). Through action research teachers have the opportunity to design a study of interest that supports them in developing an understanding of a challenge that they face and trying to find solutions within the context through self-action and self-reflection. Through reflection teachers learn to do things differently and in an improved manner that is directly linked to their context (McBee, 2004). Different from only reading about and implementing results from researchers, teachers participating in action research projects construct knowledge that is relevant to understanding how to create contextual interventions that will change their practices (McBee, 2004). What teachers know and are able to do influences children learning (Fullan, Hill & Crevola, 2006) and thus, the learning of teachers needs to be a continuous process. This calls for teachers to develop knowledge within their teaching context.

In action research participants examine their own educational practices systematically and carefully, using research techniques to understand and make improvements when necessary (Darling-Hammond, 2011; DuFour, 2004; Heydenrych, 2001). The role of the researcher in action research is different compared to traditional research. In action research the role of the researcher is to facilitate change. Action research in educational contexts is based on the assumption that teachers and educational administrators work best on the

problems they have identified themselves. Teachers become effective when encouraged to examine and assess their own work and enabled to consider ways of working differently.

Teachers in solving a practical school problem develop abilities to help each other by working collaboratively, resulting in supporting each other in their work-based professional development (Lundeberg, Bergland, Klyczek & Hoffman, 2003). Use of action research particularly in changing teachers' practices is important because those who participate in the research are active participants, subjects, not objects for research (Markic & Eilks, 2011; Mencke, 2013).

This study is based on the idea of work-based professional development. In this study teachers identified their classroom practices and challenges. They prioritized the identified challenges and worked collaboratively with the researcher in the school community and decided to change their teaching practices. Therefore, all actions were implemented after the teachers had planned, collected data, analysed, and reflected upon the findings and later prioritized and acted upon the agreed actions as a whole group. In this respect, the action research conducted in this study was mainly collaborative.

5.2 Types of action research

Carr and Kemmis (1986) denote three types of action research: technical, practical, and emancipatory action research. All three types of action research aim at improving the effectiveness of educational practice through professional development (Zuber-Skerrit, 1992). The difference is in the facilitator role, in the aim of the research and in the relationship between the facilitator (researcher) and the participants. In *technical action research* the facilitator role is the role of an outside expert and the practitioners depend on the facilitator. The facilitator will set the degree and the standards of attainment in implementing change. The aim in technical action research is to have more effective practice (Kinsler, 2010). In *practical action research* the practitioners take part in understanding and transforming practical situations. The facilitator's role is focused on encouraging participation and self-reflection. There are some aspects of consultancy in practical action research. In *emancipatory action research* the relationship between the facilitator and the participants is collaborative. There is a shared responsibility between the participants and the researcher. The aim of emancipatory action research is to critique the existing system for the purpose of transforming it (Kemmis, 2006; Kinsler, 2010). All the three types of action research are important in influencing change in schools. Schools are places where children learn in order not only to obtain knowledge but also to develop skills to analyse and critique existing systems for the purpose of transforming and/or changing. In this respect, school development towards inclusion contains an emancipatory element.

Newton and Burgess (2008) classify action research into three modes: knowledge-generating mode, practical or improvement of practice mode and emancipatory mode. In action research teachers generate knowledge in order to improve their practices as they implement the action research process. In this study there were no set guidelines to follow and there was no framework; the teachers' actions included acting to identify problems and challenges and later agreeing on how best to solve and/or improve the situation. In this study teachers were made active in transforming their actions. My role was as a facilitator as I helped the teachers to assess their existing practices and beliefs critically. The aim was to change the teachers' practices to include all children in their classrooms.

On the other hand, Ferrace (2000) classifies types of action research in terms of the way it is conducted, whether it involves a single individual or is collaborative, school-wide or district wide. For Ferrance, the issue is the number and type of persons involved in the action research process. *Collaborative* action research involves a group of individuals or a team of researchers collaboratively working in a common issue, sometimes involving external experts, for example a university researcher collaborating with teachers in a school. Examples of action research studies where a university researcher collaborates with school teachers include Kemmis and McTaggart (2000), Somekh and Zeichner (2009), Halai, Rodrigues and Akhlaq (2008), Rönnerman (2008), Reilly and Logue (2009). In these studies the university researcher is not using the teachers in schools as respondents but as co-researchers. As co-researchers the research respondents gain knowledge about their context and improve their workplace performance and at the same time the university researcher gains knowledge and understanding about how to facilitate change and what factors seem to influence change (Rönnerman, 2005). These changes through action research can be focusing on an individual basis, for example a teacher teaching a specific subject might need to improve practice as an individual teacher. In a similar way, there can be a possibility of doing action research based in a school, school-wide action research and/or based on a district (Rönnerman, 2008). There are possibilities for schools in a certain district decide to improve practice in district-wide action research.

Action research is a change-oriented type of research as its focus is on enhancing or improving social practices through informed social action. It can be said that action research is a tool used to advance social theory through planned social change projects through its stages of planning, acting, observing and reflecting (Reason, 2006). In planning, actors in social contexts are given an opportunity to identify what exists, to become informed about what strategies to take toward changing the existing social situation and to organize what available resources to use in order to change the situation. During acting the participants in the action research process try out the planned solution to the problem, collect information and question the implementation of the solution with the aim of improving it further. In the stage of observing the participants analyse the implemented solutions, and report and share information with colleagues. The final stage

involves reflection, where the participants and the researcher or consultant evaluate the implemented solutions with the purpose of revisiting the solution. Action research has a cyclical character. The cyclical character is a process that improves social actions in changing situations in context. Action research engages with problems and learning in the act of creating change. These actions and learning form a cycle with different phases to create a dynamic relationship between action researchers and an action research project in order to enhance change associated with the interactions of variables in the study. Learning in action research is enhanced when the action research process produces changes in a systematic way to yield the best results.

5.3 Action research in changing teachers' practices

As stated above, action research is an approach used to bring about change. Change in action research is not imposed but is facilitated and those who change are involved in the research in question. It is also important to note that action research is about doing research *with* others, not doing research *on* others, thus setting it apart from other scholarly research traditions (Heron & Reason, 2001; Nkoane, 2010). When a change is to take place in a school, for instance curriculum implementation, the change agents are the teachers, the children and the community. Change processes in schools require a number of contextual relationships to be observed. For instance, it is important to observe the relation between school syllabus and teaching methods in order to ensure that children's achievement is related to the curriculum in use. The problems are much more emphasized in countries where a centralized curriculum is used and where children's achievement is measured by an external examining board (National Examinations Council of Tanzania, NECTA). This is the situation in Tanzania.

In Tanzanian teachers are bound to implement the centralized curriculum and teachers' freedom to adapt the curriculum is limited. Nevertheless, something can be done in order to address the problems encountered and to change the situation. In action research the researcher has a dual role; he or she acts as a researcher and facilitates the research participants in observing the social interaction for creating constructs, ideas, and meanings (Halai, Otienoh, Shariff, & Swai, 2006; Reason, 2006). It is the collaborative effort that creates meanings that support changes. In changing teacher practices the researcher has to enter into the school context and understand the challenges teachers face so that through collaborative efforts both teachers and the researcher work together to facilitate children's learning.

It is believed that the effectiveness of professional development is related to the ability to understand and facilitate change toward improved classroom practices (Guskey, 2002; Halai, Otienoh, Shariff & Swat, 2006; Ross-Fisher, 2008) by employing active learning strategies and being collaborative in nature (Penuel, Fishman, Yamaguchi & Gallagher, 2007). The participating teachers in collaboration with the researcher are expected to ask questions of concern,

collect information about the question, implement a plan to change the existing situation, collect information to describe the effects of implementation, share the results of the research, and then decide if the plan was effective (McNiff & Whitehead, 2010). The expected relationship in developing practical experiences project is win-win collaboration (Smith & Krumsvik, 2007), with both teachers and the researcher working toward creating understanding of the practice with the goal not only of understanding but also changing the prevailing context in which the practice takes place.

However, there are also situations where action research cannot work. Factors contributing to the failure of action research include challenges related to research participants. These are, for example, if teachers are not given recognition and time to do research tasks, if the research agenda is controlled by the school administration and not by the teachers, if there is no consensus among the teachers about the agenda, if the teachers lack skills to conceptualize the research interests, if the teachers have a fear of research findings later to be used against them, and if there is more than one agenda going on at the same time (Nunnan, 1994). Action research also can fail if the research project intended is not accepted by the stakeholders or in contradiction with the prevailing ideas in the context where the research takes place (Avison et al, 1999).

Teachers work in complex networked environments of head teachers, parents, school inspectors, educational leaders and politicians (Dembélé & Lefoka, 2007). In such a complex work situation context-bound approaches to problem solving are needed. One of the ways to provide that opportunity is action research. There are studies which point to positive results in supporting change of teachers' practices using action research (e.g. Briscoe & Peters 1997; Brown, 2002; Christensen, 2005; Goodnough, 2011; Lothan 2010; O'connor, Greene & Anderson, 2006). In the African context studies using action research are rare. However, two studies relevant for this study exist (Fean, 2012; Pryor, 1998).

Brown (2002) investigated teachers' perceptions about their role, knowledge about teaching, teaching practices and reflective practices. The study revealed that the engagement of teachers in stages of action research provided them with skills for implementing and analysing the teaching and learning process. It is through analysing the teaching and learning process that teachers develop skills to better facilitate the learning of children. The study by Brown in 2000 was limited to one school, one district, and six teachers participated in collecting, analysing and reflecting on their findings. None of the six teachers had any previous training in action research. This indicates that action research can be implemented by anyone provided they are facilitated by a researcher. Briscoe and Peters (1997) worked with 24 elementary school teachers who attended three weeks of summer institute training in action research and follow-up during the year. The findings indicated that teachers' skills in action research developed through training, and practice experience in their schools increased their ability to analyse and change classroom practice to better facilitate learning.

Christensen (2005) facilitated collaborative action research for teachers and found that it had positive effects in changing teaching practices. Teachers who participated in the collaborative action research were able to improve their teaching and developed skills to facilitate inquiry learning in science. By participating in action research teachers gained new knowledge that supported them in broadening their understanding of the problems they faced; they learned research skills and developed skills in supporting each other in facilitating the teaching and learning process in the school. O'connor et al. (2006) investigated the views of 34 elementary school teachers who participated in a one year course in action research. The findings indicated that action research is an effective ongoing professional development process that impacts teaching and that action research is instrumental in changing teachers' practices. Lothan (2010) examined the role of a school principal over a seven year period in affecting the teaching of literacy using action research in Quebec through think-act-reflect cycles. The findings indicate that the principal's practice grew and improved. Goodnough (2011) investigated teacher perceptions of the long-term impacts of engaging in collaborative action research on professional identity and practice. The study involved 10 teachers who had the chance to reflect before, during and after engaging in action research. The findings indicated that teachers changed their practices.

The importance of action research in education is also noticed in Africa. For example, Fean (2012) investigated knowledge about teaching, its development and researcher practice through collaborative action research with adult education teachers in Sudan. Nineteen teachers participated in the study. The teachers were able to develop action research skills to support their teaching through developing reasoning about what they do. Pryor (1998), writing about action research in Western Africa, puts much emphasis on action research due to its sensitivity to the context and the concerns of the research participants. According to Pryor, action research addresses problems that are faced by practitioners and an outsider has little knowledge and understanding about them. Adding to Pryor's (1998) ideas about action research, Somekh (2006) is of the view that action research is a professional development tool for teachers with low levels of training. The low level of training of teachers in Africa and Tanzania in particular is a challenge. Pryor and Meke (2008), in investigating how collaborative action research can help to mitigate challenges in teacher education, concluded that the approach could be helpful in improving teacher education and teachers' practices.

In this section I have shown action research to be an effective tool for changing teachers' practices, both in developed and developing countries in many ways and contexts. In Tanzania most of the teachers are not trained on how to support children with disabilities enrolled in schools, I find action research can be thought of as one of the solutions to challenges teachers are facing. Action research is context bound and thus teachers learn while meeting their work obligations. Through the process of learning in the context of their workplace,

teachers are able to solve problems that they face in their schools. At this point I agree with Pryor (1998) about the importance of action research as it addresses the concerns of practitioners which may not occur to an outsider. As stated and exemplified above, there is a large body of action research focusing on changing practices in education settings. However, studies related to special education are sparse. In the next section I discuss how action research can be used to facilitate the learning of children with disabilities enrolled in regular schools.

5.4 Action research in special and inclusive education

The use of collaborative action research has spread into many areas in education, also into the field of special educational needs. It contributes to the improvement of classroom practices in classes including children with disabilities. Action research in special and inclusive education is regarded as a topical agenda since children with disabilities are increasingly enrolled in regular schools. Action research conducted by teachers or practitioners in school contexts using qualitative inquiry methods is a tool for studying what is happening in the schools and determining what educational interventions are successful (Mills, 2011; Rouse, 2007). Teachers or other practitioners can engage in action research for the purpose of taking actions and effecting positive educational change, leading to improved practices. In the era of inclusive education, action research is of high importance as it can support the attainment of the main goals of inclusion: to promote the participation of those children who are enrolled in schools but are excluded from learning, and to promote the learning of those relatively small groups of children with disabilities who may require some form of additional support.

Studies that show the effectiveness of action research in special and inclusive education have been conducted in many western countries (e.g. Angelides, Georgiou & Kyriakoua, 2008; Argyropoulos & Stamouli, 2006; Dobson, 1996; Dymond et al., 2006; Dyson, Howes & Roberts, 2002; Lloyd, 2002). Also one study from the African context was found (Makoelle, 2012). Dobson (1996) conducted an action research project on the effectiveness of the provision of training for special needs support assistants by a speech and language therapy department. The study focused on ensuring the right to education of children with speech challenges. In the study, 60 school support assistants attended the course. The findings indicated that all school assistants who attended the course changed their practices and improved their services in their schools. Angelides, Georgiou and Kyriakoua (2008) conducted a study to investigate the role of collaborative action research in implementing inclusive education in primary schools in Cyprus. The study involved teachers in one primary school. The findings indicate that inclusive education is a complex phenomenon, and in order to succeed it needs networked social learning within the workplace that builds on existing conditions through which action research is regarded as a tool for change.

Lloyd (2002) developed a professional development program that used action research. The program focused on empowering practitioners in the area of SEN and inclusion. The findings of the study demonstrated that carefully planned and structured continuing professional development, that requires research participants to practice and reflect, has the potential to develop individual teachers' knowledge and skills in changing practice in education and ensuring social inclusion.

Dymond et al. (2006) investigated the redesigning of a science course to become more inclusive using participatory action research. The study tried to find ways to make the curriculum more accessible. One regular teacher and two special education teachers participated in the study. Each section of the curriculum that needed to be redesigned included the learning needs of children with and without disabilities. The redesign process involved changes to the course in the areas of curriculum, instructional delivery/organization of learning environments, student participation, materials and assessment. Data were collected across one school year through documents, interviews, and focus groups and were analysed qualitatively using a constant comparative method. The findings were that teachers changed their practices and increased access to the curriculum.

Makoelle (2012) investigated the use of action research in developing practices of inclusion in a South African school, relating the dynamic relationship between action researchers and an action research project. The study used 15 teachers from a school that served a previously disadvantaged community with a student population with diverse socio-economic, linguistic, ethnic and cultural backgrounds which presented barriers to learning. The findings in the study indicated action research to be useful in developing the practices of inclusion. In South Africa as in other countries in Africa, teachers do not use reflection in their teaching. Through action research the teachers had been involved in different collaborative activities during implementation of the action research project. The study did not directly address disability issues, but it is important because socio-economic disadvantages like disabilities are barriers to learning, and the results from the study are easily transferred to school contexts where children with disabilities are enrolled.

Argyropoulos and Stamouli (2006) conducted collaborative action research aiming at achieving better inclusion of a blind child in the school subject content. The project aimed at increasing access to the curriculum for a sixth-grader blind child integrated in a public rural primary school. This study demonstrated partnership between a school and a researcher from a university. The participation of the teachers in the action research process improved their practices in enhancing learning and increasing the learning achievements of the child with severe VI. This study indicated that action research can be of importance in improving the quality of learning among pupils with disabilities, as well as pupils without disabilities.

Based on the findings of the above reported studies, it can be concluded that action research is likely to contribute to the efforts of including children with special educational needs in regular classrooms through improving classroom teaching and learning processes. Improved classroom practices are likely to raise the achievement of all children, including those with disabilities and thus reduce dropout rates in the education system (Black-Hawkins, Florian & Rouse, 2007; Peters, 2007; Schiller & Einarsdottir, 2009). In the next section I describe action research as a tool for school-based professional development (SBPD). School-based professional development focusing on inclusive education has not been used to a large extent. Action research is also not very well known in the African context. However, action research has the ability to facilitate a change of school culture and teachers' practices. In this respect, action research is conceptualized as one form of school-based professional development.

5.5 Action research as school-based teacher professional development

School-based teacher professional development (SBTPD) is about providing opportunities for teachers to engage in changing practices in educational matters within the school context. It is about learning through teachers' daily actions, bringing about increased teacher knowledge, what teachers learn and how the learning is translated into action. It is about the systematic actions of teachers that bring about learning and changes of practice. SBTPD can take different forms such as action research, focus group discussions, coaching, critical friendship groups, mentoring, portfolio, lesson study or study group. For SBTPD to be effective, Boaduo (2010) proposes that teachers should identify needs and aims, make priorities, establish a professional development team and committee and identify resources, agencies and methods for articulation and application. For situations where there are inadequately prepared teachers, action research can be used as a form of professional development. Of the SBTPD strategies mentioned above, the action research approach in SBTPD is meant to improve teacher practices and allow teachers to analyse situations, plan for intervention and evaluate (Cochran-Smith, 2004).On the other hand, Day (1999) views professional development as consisting of all natural conscious and planned learning experiences that are intended to have direct or indirect benefit to both an individual or group of individuals, which contribute to the quality of classroom teaching and learning.

The term school-based teacher professional development refers to on-the-job training, self-advancement, within-the-job learning and is grounded in day-to-day teacher practices designed to develop new instructional skills to facilitate the learners. Scholars (Hawley & Valli, 1999; Norman, Golian & Hooker, 2005) relate school-based teacher learning to teachers' ways of enhancing content-specific instructional practices integrated into the workday, where teachers analyse their practices, create intervention strategies and solutions to authentic and immediate problems. Teachers through school-based professional

development share goals in the continuous improvement of practice and connect their learning directly to application in their daily practices. School-based teacher professional development is situated in the school and is about the current work of schools. When school-based teacher professional development is linked to action research, the participants continue to plan, act and reflect on different intervention strategies to improve school outcomes.

There are advantages in using school-based professional development. One of the advantages of SBPD is that it provides opportunities for the school community members to address local issues and needs over a period of time. School-based professional development encourages individual initiative and collaborative approaches to addressing challenges and allows more flexibility, intensive and sustained teacher professional development. It also provides ongoing opportunities for professional learning among a single set of teachers (Burns, 2010). If school-based professional development is linked to action research, the participants develop new knowledge and at the same time develop research skills that facilitate systematic change of their practices.

Darling-Hammond, Wei, and Andree (2010) establishes the role of school-based teacher professional in increasing school achievement by referring to the way high-achieving countries develop teachers. As part of school-based teacher professional development in Canada they use 'research lessons'. One teacher prepares a lesson and other teacher criticizes it and develops a better lesson. These research lessons allow teachers to modify their future lessons. As teachers there is call to other teachers to try out, and to be observed. In Singapore in 1998 a vision of 'thinking schools, learning nation' was introduced by Prime Minister Goh Chok Tongs, which aims at producing life-long learners by making schools a learning environment for everyone, from teachers to policy makers, with knowledge spiralling up and down the system (Darling-Hammond et al., 2010). Teachers become empowered to influence the curriculum and evaluation. In this way teachers become owners of the learning process. Instead of schools being a place of work, they turn into a place to get insights about life.

In action research teachers are involved in identifying problems affecting the school context for the purpose of changing to improved situations. Action research is useful in developing a sense of community among teaching staff for sustained school improvement (Chance & Segura, 2009). School-based professional development allows teachers to tackle problems arising in the school, where learning and teaching, curriculum innovations and implementations take place, and it provides opportunities to analyse deficiencies and improve the situation (Boaduo, 2010). The practice leads to developing a school learning community, where teachers analyse the way they implement the curriculum, develop critical friends and peer support strategies, determine inadequacies in the curriculum and change their practices as individuals or in groups through creating interactions for facilitating the learning of all children (Putnam & Borko, 2009).

Action research can be implemented in one's own school to improve practice. Schools have different contexts. Referring to Pryor (1998), action research has the potential to support participants in researching their practices and improving practices over which outsiders have less influence. Kennedy (2005) describes models of continuing professional development, where one of the models is action research. Other models are training, award bearing (a course that lead to awards), deficit, cascade, standard-based, coaching and mentoring, community of practice, and transformative (Kennedy, 2005). Action research is relevant to the classroom as it enables teachers to experiment with different practices and allows them to engage in action research processes collaboratively. On the other hand, Lieberman (1996) classifies professional development into three types: direct teaching, where one is enrolled on a course program or workshops. Learning in school is professional development that involves peer coaching, critical friends, mentoring, action research, and task-related planning teams. The last type is out-of-school learning that includes learning networks, visits to other schools, and school-university partnerships. Both Kennedy (2005) and Lieberman (1996) show that action research can be implemented in a school setting and is relevant in bringing about learning and action. School-based action research has the power to enhance collegiality among school members (Owen, 2005).

Shanks, Miller, and Rosendale (2012) investigated pre-service teachers' use of action research in a professional development school setting. Teachers were involved in planning, teaching and assessing language instruction in their classrooms. Engagement in the action research process helped teachers to adjust their teaching responsibilities. The pre-service teachers collected and reflected on their action research data in order to understand their practice, and in using their findings planned to improve their practice. Involvement in action research supported pre-service teachers in developing their confidence and competence. With these findings, school based action research empowers teachers and supports them in understanding their practices to help them to plan for further improvement.

Peterson (2012) investigated a study that involved eleven teachers and five literacy coaches who participated in collaborative action research with the aim of enhancing their teaching practices to support children's oral language development. The findings indicated school-based collaborative action research to be a useful school-based professional development strategy. The collaborative action research proved to be successful; it was inexpensive and it created effective professional learning among rural teachers, who had few opportunities for formal professional development. Peterson thus proposes collaborative action research as a teacher professional development strategy as it breaks the barriers related to geographical location, lack of access to school consultants and distance between rural schools and urban centres. The constraint to collaborative action research was related to time, because teachers have many responsibilities. However, the challenge of time can also be observed in official professional development programs, where teachers have to leave their place of work for

professional development. There are challenges outside teaching as teachers miss some of the teaching time.

In this chapter (chapter 5) I have discussed action research as a tool for change. I have also pointed at some critical aspects of action research. Besides the critique I find that action research has strengths in changing practices. In the context of this study where there are many unsolved problems in supporting the learning of children with VI action research is seen as a suitable approach because of its potential of involving participants, the teachers, in changing their practices. Furthermore, action research is considered as one type of school-based professional development with the potential to develop practice (Mertler, 2014; Bruce & Pine 2010; Gordon, 2008; Pine, 2008; Stringer, 2008). This combined approach, school-based professional development and action research as praxis-related research allowed me as researcher and facilitator to study the change processes.

I have also described the context of my study (Chapters 2-4). I have chosen to highlight the situation in Tanzanian schools in some detail in order to provide an understanding for the need for change. Many frame factors, such as unqualified teachers, shortages of special education trained teaches, use of non-interactive teaching methods, un-coordinated professional development strategies, large classes and lack of resources are given and cannot be changed very quickly. However, my assumption was that focusing on teachers and engaging them in school-based professional development and choosing action research as my methodological approach could improve the situation in schools for the benefit of children with visual impairment who are enrolled there. In the next chapter I describe the method of my study.

6 Method

This study investigated teacher practices and the changing of these practices in regular classes enrolling children with VI. Teachers in this study participated in a collaborative action research process in order to facilitate the learning of children with VI. In this chapter I present the overall aim, research task, research design, research project execution, site of the project, participating teachers, data collection tools, data analysis, trustworthiness and ethics.

6.1 The general aim and research task

The general aim of this study *is to contribute to increased knowledge and understanding about how teachers can change their teaching practices and thus facilitate the learning of children with visual impairment included in regular classrooms as they participate in an action research project.* In this study teachers investigated their practices and challenges for the purpose of understanding and changing the practices in order to facilitate the learning of children with VI included in regular classes. The teachers were involved in identifying challenges, proposing solutions, implementing, and evaluating them. They were bridging the gap between theory and practice. Through participating in the action research project they were developing knowledge and skills they could use in solving their contextual challenges. The teachers were facilitated to put the collectively developed knowledge and understanding into action. The project followed the cyclical nature of action research. This cyclical nature is one of the core characteristics of action research (Carr & Kemmis, 1986; Smith & Krumsvik, 2007). Thus, the project actively involved the teachers in planning, acting, observing, reflecting and re-planning. Based on the general aim, the research task in this study was formulated as follows:

To describe and analyse how teachers during participation in an action research project changed their teaching practices and facilitated the learning of children with VI enrolled in regular classes.

In this action research study I was actively involved with the participating teachers in investigating teacher practices and challenges and together with them planning solution strategies. However, my role was only that of a facilitator. I did not suggest any improvements or solutions. The participating teachers had the power to decide what to do. The participants continued working in their natural working environment while they were actively participating in the action research process. My aim as facilitator was to find out how to empower teachers through school-based teacher professional development implemented in the

school without altering the school calendar and on-going school activities. I wanted the school context to be as authentic as possible.

6.2 Research design

The research design forms the plan according to which the research is conducted. The design guides the researcher in data collection, data analysis and presentation of the research findings. This study can be characterized as a case study as I was studying a contemporary phenomenon (teachers' practices in regular classes enrolling children with VI) in a real life context (three regular schools). The case study approach was regarded as appropriate as there was no clear-cut boundary between the phenomenon and the context. I also used multiple sources of data, another characteristic of case studies, which provide rich and detailed accounts of the present status of the phenomenon in order to influence change (Ary, Jacobs, Razavieh & Sorensen, 2006; Berg, 2007; Ellet, 2007; Yin, 2009). According to Makoelle (2012), cases are often chosen for their representativeness and relevance for what is studied. When I chose my cases (schools), I had this in mind. However, the aim was not to make generalizations, but to achieve a detailed description of the case (cf. Makoelle, 2012).

Researchers (Denzin & Lincoln, 2005; Scott & Usher, 1999; Yin, 2012) agree that a case (study) is not a methodology but rather a choice of what to be studied. Case study research can comprise many methodological approaches. The methodological approach used in this study is collaborative action research. The study is qualitative in nature. Action research design was chosen as the purpose was to bring about change. My preference was also reflective rationality, rather than technical rationality. According to Altricher, Posch and Somekh (1993) reflective rationality means that real problems are always complex in nature and need solutions to be developed within the context. In this study the context and the focus were school settings where children with VI were included in regular classes and taught by regular teachers. My assumptions were that by using the practitioners' experiences I could facilitate them in developing their teaching through engaging them in analysing their practices, planning for change and implementing the change process.

The action research approach was chosen in this study because it is a process that involves systematic collection and analysis of data in order to make changes and improvements or to solve identified problems (Kemmis, 2009; McNiff & Whitehead, 2010; Winter, 1989; Carr & Kemmis, 1986). Action research as defined by Kemmis and McTaggart (2007) is a spiral that allows continuous reflection (a more detailed discussion on action research is found in Chapter 5). In this study teachers were reflecting on their teaching practices to explore their problems and challenges they faced for promoting teaching and learning in classes including children with VI.

In order to increase my understanding about teacher practices and challenges in regular schools, including children with VI, I conducted a pilot study in a

relatively well-resourced school in 2007 (Mnyanyi, 2007b). The findings indicated that both special education and regular teachers experienced practical related challenges in facilitating learning in a regular classroom with children with VI. These findings helped me to realize the nature of change processes. In implementing the action research project my aim was to facilitate teachers in creating an inquiring culture in a community of practice between the teachers and myself as researcher in a collaborative form. The created inquiry fostered understanding of the problems, issues and practices of teachers in their authentic environment with the goal of understanding and changing their practices (cf Kemmis, 2009). During action research we shared a common goal of facilitating the learning of children with VI included in regular classes in regular schools. In maintaining collaboration as the university researcher, I had a number of dialogue sessions through meetings and focus group discussions and used the common language in school, namely Kiswahili. According to Furu and Salo (2005), communication which is mediated through language plays an important role in action research. Teachers were made the owners of the project as they participated in all reflection meetings, and we decided together on the learning journey for the next action research cycle. The reflection meetings were meant to lessen the impact of school practices and hence allow teachers to demonstrate their skills and knowledge about teaching children with visual impairment enrolled in the school (Eilertsen, Gustafson & Salo, 2008). In this action research the power influences from the researcher continued to be lessened and the teachers, as well as the children, were empowered to become co-researchers as they participated in improving the teaching and learning environment. The participating teachers changed their practice in school as they participated in the action research cycles.

In the next section I describe how the action research project was implemented.

6.3 The action research project

The action research project was conducted in three phases between 2007 and 2009. The first phase constituted a pilot study in 2007. The pilot study was followed by the first phase of the main study, which started in 2008. The two studies led to the implementation of the actual action research project in 2009 at Maisha Primary School in Singida Region in central Tanzania. Below I describe the three phases of the action research project.

6.3.1 Phase I: Pilot study

I conducted the pilot study between March and August 2007 for the purpose of understanding the phenomena and to plan for the project and for the change process (Mnyanyi, 2007[14]). In action research a pilot study can be seen as one of the stages in an ongoing research process (Herr & Anderson, 2005). This was also my initial plan. The pilot study was conducted in Liwewe Primary School (actual name has been changed) which was a rather well-resourced school in Dar es Salaam, where children with VI were included in regular classes. The school had a large number of teachers specialized in VI as well as teachers with VI, teaching resources for children with VI, assistive special technology equipment and a centre for eye assessment. The school was close to the Braille printing press where books for children with VI in Tanzania are produced. Teachers in this school did not participate in itinerant services, which meant that they were at the school the whole time. This well-resourced school was chosen because it gave me as a researcher an insight into the challenges regular teachers meet when teaching children with VI and also an insight into possible solutions to the challenges. I wanted to learn what was possible to do in order to transfer this knowledge to other less resourced school contexts. I intended to use the experiences and findings from the pilot study in the planning of the main study.

The pilot study was guided by the following research questions:

- What are the challenges regular primary school teachers faces in teaching a class including children with VI?
- What can regular teachers do to improve teaching practices in primary schools including children with VI?
- How can teachers facilitate the learning of children with VI included in regular primary school classrooms?

The participants in the pilot study were 11 teachers teaching children with visual impairment. Out of the 11 teachers 7 were specialist teachers (specialized in VI), while 4 teachers were regular teachers. Of the regular teachers, one was a teacher with visual impairment. Data was collected through interviews and a questionnaire to teachers (Appendix 3).

[14] The findings of the pilot study are reported in Mnyanyi (2007).

The findings of the study indicated that teachers were able to identify problems faced in the teaching and learning situation, in their work as teachers and also in the methods and strategies they used in teaching. The experienced challenges could be categorized into teacher-related factors, school-related factors, social factors and learner-related factors. The teacher-related factors included lack of knowledge and skills on how to teach children with visual impairment who were included with their sighted peers, and lack of ability to assess the children's learning. The school-related factors were large class sizes and poor classroom provision. The social factors were related to awareness and acceptance of children with VI in the school setting. This acceptance was often related to the mode of text (Braille) the children used. To show that children with VI are accepted, schools had to ensure the accessibility of learning resources to all, including visually impaired children. In the pilot school, children with VI used Braille, whereas sighted children used normal text. Not all teachers were conversant with Braille. Leaner-related factors included motivation to learn, participation in the learning process, self-confidence and preference in mode of delivery. Teachers identified leaner related factors that included motivation to learn, participation in the learning process, self-confidence and preference in mode of delivery. However, the teachers were able to propose solutions on how to improve the teaching and learning situation of children with VI included in their classrooms. The solutions were related to the supply of teaching material in Braille, and skills of the teachers in listening to the voices of the children (Messiou, 2003).

In the pilot study I learnt that teachers can identify their challenges and problems, and some were able to propose solutions. Teachers can also identify children with VI and the challenges they face in accessing, participating and achieving the planned curriculum content. The question was why they did not implement the proposed solutions. The other lesson learnt was that there were shortages of resources, which made it difficult to implement the proposed solutions. This gave rise to the idea of including both children with VI and the sighted in the next phase of the study so that children and teachers could help each other to solve the identified challenges. I thought that collaboration might solve at least some of the challenges teachers were facing.

In the next section, I describe phase two of the project. Phase II was from the beginning planned to be the first part of the main study. There were three schools that participated in the second phase of the action research study. In the second phase the respondents were teachers, pupils, and parents.

6.3.2 Phase II: The study, part one

In choosing schools to be included in the study I visited the Tanzania Society for the Blind (TSB), where I obtained the list of schools that included children with visual impairment in regular schools. The TSB monitors all the itinerant teachers supporting children with visual impairment in Tanzania. From the list I selected three primary schools: two in Dar es Salaam and one in Singida. Singida was

chosen because it is a rural setting in central Tanzania faced with challenges including transport, school infrastructure and shortages of teachers. Also the prevalence of visual impairment is relatively high in Singida. (See detailed information in section 6.3.3). The three schools were selected due to their variability. The two schools in Dar es Salaam, Livi and Kava, were supported by an itinerant teacher. The school in Singida, Maisha, had two teachers with training in special education who were also serving as itinerant teachers to other schools and managed a preparatory class at their school.

Phase two of the study was implemented in schools with few teaching resources, few specialized teachers and large class sizes in 2008. I used the findings from the National Disability Survey conducted in 2008 by the National Bureau of Statistics in order to find suitable schools (NBS, 2008). Data from the survey indicated that the prevalence of disability in urban areas was lower than in rural areas. The schools, Livi, Kava, and Maisha, were a representative sample of regular rural and urban primary schools in Tanzania. Maisha Primary School is a typical rural school with few resources. Livi and Kava primary schools are typical urban schools with no special teachers for children with VI available. All regular schools including children with VI in Tanzania are faced with the same kind of challenges: few specialist teachers, a lack of teaching materials, overcrowded classrooms and lack of equipment to support the learning of children with VI. The schools were chosen because I wanted to study what was possible to accomplish in regular primary schools with one or more children with VI included and with teachers who are not trained in pedagogy for learners with VI.

The study in phase two aimed at determining the situation in the schools in terms of practices, challenges, and solutions implemented in classes which included children with VI. A total of 157 participants from the three schools (53 teachers, 5 parents of children with visual impairment and 97 children) participated in the study. Out of 97 children there were 37 with visual impairment. Out of 53 teachers there were 3 trained in special education (specialized in visual impairment) who also served as itinerant teachers. One of the three special education teachers, apart from serving as an itinerant teacher, was also head of the school. Data collection in the study included questionnaires for teachers and children and interviews with teachers, children and parents (Appendix 4).

As the study has been reported earlier (Mnyanyi, 2009), I briefly summarize the main findings. The findings in the study supported the findings in the pilot study. Teachers, parents and children indicated that there were problems in the teaching in classes including children with VI. Most of the teachers in the three schools had no or limited knowledge about how to facilitate the learning of children with disabilities included in their classes. Parents had low expectations of the benefits of education for their children with VI after completing basic education. Children with VI viewed inclusion to be good, but some of the children with VI had the view that teachers did not include them in the teaching process. Teachers, parents and children shared their views on the challenges in classes with children with VI. Their views were related to the availability and use of

teaching materials, availability of specially trained teachers for children with VI, availability of teacher training opportunities in learning strategies to facilitate the learning of children with VI, and equipment. It could be concluded that the findings from the pilot study and this study implied that there was a need to support teachers in developing their teaching practices to facilitate the learning of all children included in their classes. The findings gave me as researcher important information about how to proceed and what to focus on.

The findings from the pilot study and this study indicated the need to focus the project on teacher support aiming at analysing and changing the teaching practices. I planned to continue in all three selected schools, namely Livi, Kava, and Maisha Primary Schools. However, I had to change my plans as the pupil from Livi Primary School graduated and the pupil from Kava Primary School was transferred to Liwewe School (the pilot school). Thus, I remained with Maisha Primary School, where the action research project continued in March 2009.

6.3.3 Phase III: The study in Maisha Primary School

Maisha Primary School also participated in the second phase of the action research. The school was suitable for several reasons: availability of children with visual impairment included in regular classes, large class sizes, rural setting, few available resources and teachers with inadequate knowledge in special education. Another reason for choosing a school in Singida Region was the prevalence of visual impairment. According to a study conducted by the National Bureau of Statistics in 2008 on disability in Tanzania, the prevalence of visual impairment was relatively high in Singida (7.4%) compared to other regions in the country (see Appendix II). Singida also faced many health-related challenges: shortage of water, shortage of health services, shortage of eye specialists, inadequate support services for the few available eye specialists, the inability of people to pay costs related to eye treatment and the fact that few people showed up in hospitals for eye checks (Singida Region Vision2020 Report, 2006; Kessy, Mashindano, Rweyemamu & Chale, 2011). Singida depends on Kilimanjaro Christian Medical Centre (KCMC) in Moshi for all eye operations[15]. Another reason was the fact that a number of programs on awareness of vision problems had been going on in the region since 2004 (Singida Region Vision2020 Report, 2006; Lewallen et al., 2008).

At the time of the project in 2009 Maisha Primary School had 35 children with visual impairment (24 boys and 11 girls) out of a total of 1258 children (658 boys and 601girls) included in 13 classrooms (average of 97 students per

[15]The district had a shortage of health facilities, and according to a report from 2002 the population per health facility was 9100 in Singida Rural District to which Maisha School belonged, compared to 6756 in Singida Urban, 5527 in Manyoni and 7647 in Iramba - both districts in Singida Region (URT, 2005; Kessy, Mashindano, Rweyemamu & Chale, 2011).

classroom). Children with visual impairment in the school were about 3% of the total school population. The number of students in the school (1258) did not include those from the two pre-schools, one for sighted children and one for children with visual impairment. The distribution of children with visual impairment in the school is presented in Table 3.

Table 3. Distribution of children with VI at Maisha Primary School

Class/ Grade	Boys	Girls	Total
I	5	4	9
II	5	5	10
III	6	2	8
IV	4	-	4
V	-	-	0
VI	2	-	2
VII	2	-	2
TOTAL	24	11	35

Source: Field data (2009)

More children with VI were enrolled in classes I to III compared to the number of pupils with VI in the upper classes (classes IV to VII). This was due to the fact that the school also served as a preparatory centre for children who would later be included in regular schools near their homes when starting class IV. The preparatory centre was managed by two teachers specialized in visual impairment. In the preparatory centre children with VI learnt Braille skills, mobility orientation, communication skills and classroom and daily life skills. The two specialist teachers supported children with VI in other schools through itinerant services.

During the time of the study the school had a resource room with 29 Perkins Braille machines, 12 (pcs) of Braillon papers (plastic-like paper developed specifically for use with Thermoform machines), one Thermoform machine (a photocopier for Braille print), 19 typewriters, 20 styluses, 40 white canes and 10 reams of Braille paper. In relation to the 35 children the school had inadequate resources. At the time of implementing the project the school had no copies of reference and text books in accordance with the new primary school curriculum from 2005 for children with visual impairment The shortage of Braille books might have been attributed to the open book policy that allowed printers to print as many types of books as possible and to the mandate of the schools to select the books to use. None of the printers had decided to print Braille books. The few available Braille books were for the old primary school syllabuses, which could mislead children if they were used. This meant that the children with VI had no books.

The school had shortages of classrooms, desks, tables, teachers' offices, dormitories, books and library spaces, which negatively affected the learning of the children. The shortage of facilities and learning material created situations where sighted pupils could not learn effectively and were unable to support their

visually impaired peers. For example, shortage of classrooms resulted in large class sizes (on average each class had 97 pupils) and shortage of desks resulted in insufficient space for children with VI. They could not use Braille machines in class because of the lack of availability of Braille machines and lack of classroom space.

6.3.4 The participating teachers

During implementation of the action research project at Maisha Primary School, the school had 32 teachers. Out of the 32 teachers, 2 were trained in special education specifically for children with visual impairment and six (6) were (regular) teachers with visual impairment. The two teachers trained in special education acted as itinerant teachers serving other regular schools including children with VI. According to the information obtained from the head of school, the school had a shortage of 5 teachers.

At Maisha Primary School 14 teachers, (6 males and 8 females), teaching grade 4 and grade 6 participated in the study (Table 4). I chose grade 4 and grade 6 because children with visual impairment were included in regular classes when they were in grade 3. After completing grade 3, some of the children were transferred to other schools. Those who continued in year 4 stayed until they completed their studies in grade 7. In grade 4 children with VI had one year of experience of the lower grades (grade 1-4). In grade 6 the children had two years of experience of the upper grades (grades 5-7) and a total of three years of experience of regular classes. Table 4 shows basic data about the 14 teachers participating in the study. They were all teaching large classes (ranging from 61 to 79 pupils per classroom). The average number of students per class as mentioned earlier is 97 if all children and all classes have an equal number of children. This is not the situation in the school. Class 6 averages are a little lower because in Tanzania children in primary education sit class 4 examinations, and those who pass are promoted to higher classes. It is expected, therefore, that more children will be in lower classes. In total 6 children, all boys, from grades 4 and 6 participated in the study.

Table 4. Background information of teachers participating in the project

Name	Gender	Age	Teaching Subject	Years of teaching (children without VI)	Years of teaching (children with VI)	Class teaching	Average number of children in the class
Agnita	F	32	English	5	5	4	76
Amos *	M	36	Civics, History	0	11	4,6	76
Antonia	F	22	English	0	1	6	61
Baraka *	M	40	Kiswahili	4	10	4	79
Benjamin	M	39	HaibanaMichezo (Personality and Sports)	5	11	6	70
Betty	F	25	Stadi za Kazi (Vocational skills)	0	3	6	61
Boni	M	31	Mathematics	0	4	6	77
Clara	F	29	Kiswahili	0	2	4	78
Edina	F	29	Geography	0	1	4	78
Esta	F	24	History	0	2	4	78
Herena	F	32	English	5	4	4	79
Mercy **	F	29	Civics	5	<1	6	77
Mselem**	M	43	Science	2	10	6	61
Msigalila	M	38	Mathematics	13	4	6	61

* Teachers with visual impairment, ** Regular teachers trained in special education

Note: *Teachers real names have been changed.*

Source: Field data (Questionnaire, March 2009)

The 14 teachers who participated in the project had varied teaching experience from both regular classes and classes including children with VI. Among the participating teachers two teachers, Amos and Baraka, had visual impairment. In all there were 6 teachers with VI, but 4 of them did not participate in the project since they taught other classes. All the teachers with VI, including Amos and Baraka, were trained as regular teachers and despite their impairment had skills in teaching sighted children. They had no formal training in special education. However, two of the teachers, Mercy and Mselem, had additional training in special education specifically for children with VI. They were also itinerant teachers for the neighbouring schools. Their school was used as a preparatory centre for other children with VI who were later to be enrolled in nearby schools.

Out of the 14 teachers, 6 had long teaching experience (10 years or above), but most teachers had teaching experience of between 1 and 5 years. One of the teachers, Mercy, who had just completed a one year certificate course in special education, had less than one year teaching experience in the school. The teachers with visual impairment, Amos and Baraka, had more than 10 years of teaching experience. The participating teachers represented teachers with more experience, teachers with less experience, teachers trained in special education and teachers with visual impairment. This type of composition of teachers is likely to be found in many schools including children with VI in the country. Therefore, the group of teachers participating in this study can be said to represent the larger group of teachers in schools including children with VI in the country.

6.3.5 The action research project at Maisha Primary School

The action research project can be characterized as a collaborative action research project. The actual action research cycle at Maisha Primary School started in March 2009 and was conducted in five cycles over a period of 7 months (March 2009 to September 2009). After receiving the informed consent from the education authorities in the region and district office, head of school and the participating teachers, the project began.

As I initiated the study as an outsider, the first action research cycle was planned in advance and meant to collect data pertaining to school ecological factors. The issues explored were background information of the school, teacher profiles, pupil profiles, teaching methods used, teacher qualifications, school support strategies and the challenges teachers face in teaching children with visual impairment included in regular classes. Data in the first action research cycle was collected through interviews, questionnaires, focus group discussions and document reviews (Appendix 5). The first action research cycle, as well as the following cycles, ended with a reflection meeting where the agenda for the next cycle was planned with a series of new questions or issues to be addressed in the following action research cycle. Results from one action research cycle informed the actions to be taken in the next one (cf. Feldman, 2007; Heikkinen, Huttunen & Syrjälä, 2006). In ensuring the principle of reflexivity and dialectics, the outcomes in each action research cycle results were presented in a reflection meeting with teachers to discuss and comment on. This helped to collaboratively construct knowledge. As an outsider researcher, I did not impose any actions. Instead; my role was to facilitate teachers in making decisions and guiding them in actions and reflections on actions. In each action research cycle, the participating teachers, together with me as researcher, planned jointly issues to address in response to the previous action research cycle. Altogether, there were 5 cycles of action research (Figure 1). The last cycle ended with evaluation of the activities that took place in the project and the whole action research project.

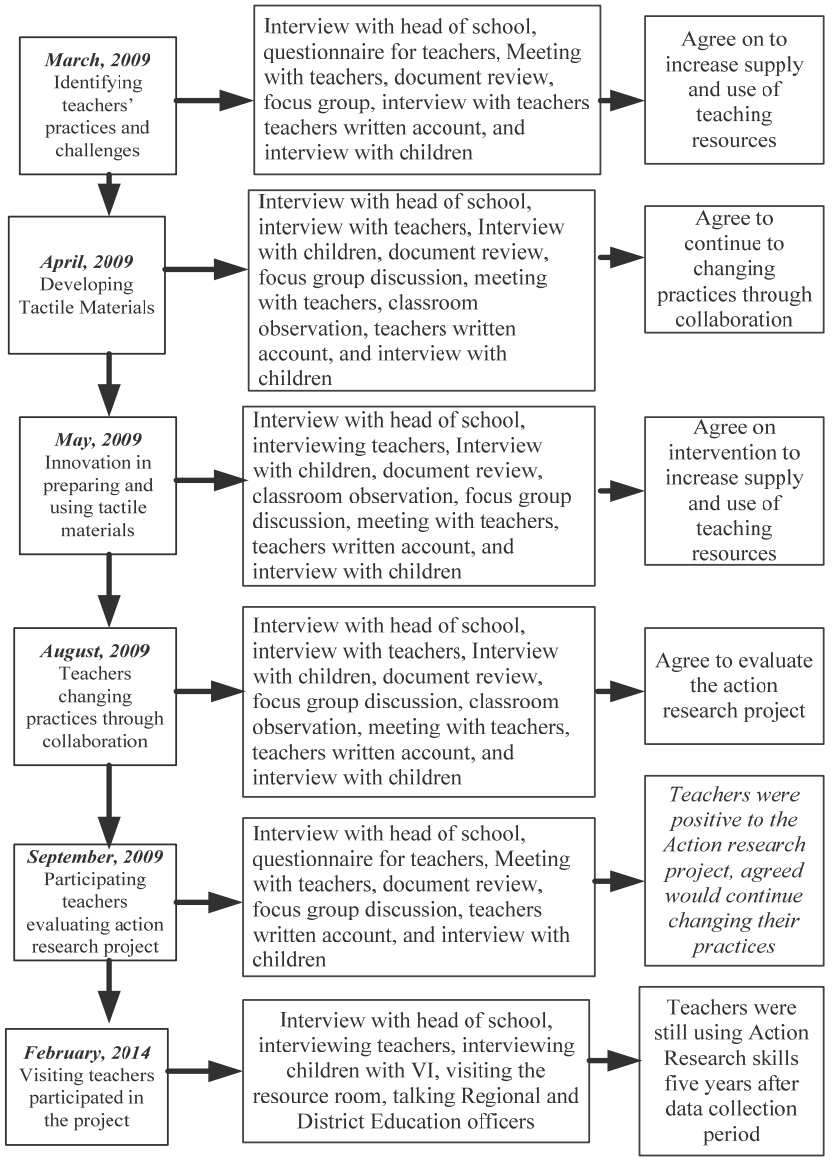

Figure 1 Action research process at Maisha Primary School

6.4 Data collection instruments

It is recommended that data collection should be planned according to the design of the study. I chose data collection methods which allowed access to teacher practices and challenges in the school. The chosen data collection methods were interviews, focus group discussions, observations, questionnaires and document reviews. The use of different data sources helped me to validate and crosscheck findings, a procedure recommended by several qualitative researchers (Patton, 1990). I was also eager to listen to the voices of those involved in the research,

mainly the teachers, but also the children with VI. According to Kemmis (2006), the participants' voices are important. In the reflection meetings the participating teachers could express their voices freely. To ensure that no important data would be missed I used Kiswahili as a mediating language during the data collection process. Kiswahili is the medium of teaching and learning in primary schools in Tanzania (URT, 1995). Not all teachers teaching in primary schools are fluent in English. Language is said to be one of the most important tools in action research (Furu & Salo, 2005). This was also a reason for choosing Kiswahili instead of English. Below I describe the data collection methods used.

6.4.1 Interview

The interview is the most common method used in collecting qualitative research data. It is a two-person conversation initiated by a researcher for the purpose of obtaining relevant information that answers the research questions posed (Corbin & Strass, 2008). Flick (2007) defines the interview as accessing what is in a person's head and claims that the interview allows an interviewer to measure or understand the interviewee's knowledge, information, likes and dislikes, attitudes, thinking and beliefs. It is important to note that in an interview the relationship is created between the person who is seeking information and the one who is supplying the needed information.

In using interview in this study I prepared interview guides (Appendix 4 and 5). According to Corbin and Strass (2008), interviews are time-consuming. Corbin and Strass (2008) also mentions the lack of standardization in skills of the interviewer, power relations that might result in bias and the possibility of taking the respondent out of context as challenges. In this study these challenges were minimized, mostly because of the nature of the study, where the participants took an active role in changing their practice within the school context and within the available school time. Teachers were interviewed in order to understand and change their practices within their own context. The participating teachers had an active role in the project, and through the interviews I had the opportunity to understand the context and to facilitate the teachers in analysing their teaching, identifying challenges and possible solutions to the challenges. My role was to facilitate the process of change (Mnyanyi, 2009).

Fourteen teachers participated in the interviews. Each teacher had three interview sessions in each action research cycle. The teachers were interviewed twice during my 5 day stay in the school: one interview when I arrived and one after classroom observation. The teachers were also interviewed after the independent working period in order to get information on what went on, what were the challenges and what suggestions for the future actions. The children with VI were also interviewed in the same way as the teachers; they had two interviews during my 5 day stay in the school and one interview after the teachers had practiced on their own. In both situations I used individual interviews. I chose individual interviews because all the 14 teachers were teaching different subjects in different classes. The focus was not only on

teaching but also on how teachers developed skills in identifying challenges they faced in their teaching and learning process, in their lesson preparation and in their experiences of specific challenges in their teaching subjects. Through individual interviews I was able to document how the teachers' knowledge and skills were changing and progressing as they participated in each and within the action research cycles. All grade 4 and 6 children with VI in the participating schools participated in the interviews. The sighted children were involved only in the first part of the study (6.2.3.), where about 20 sighted children from each school (Maisha Primary School being one of them) were involved.

6.4.2 Focus group discussion

The reflection meetings and individual interviews were used to elicit the teachers' collective views. As a data collection method, focus group discussions used group interactions to produce data that might differ from other methods (Fontana & Frey, 2000; Silverman, 2009; Heneveld, 2007). In focus group discussions the research participants are free to talk and express their opinions in a natural way (Frick, 2007). Focus groups in this study were appropriate as teachers had a collective agenda on professional development toward facilitating teaching and learning of children with VI included in their classes. The teachers had to agree on what to change and how. The focus group discussion sessions had a great influence on how we related to one another; the way we greeted, talked and did things; for example, time consciousness and caring for one another (Brydon-Miller & Maguire, 2009). According to Patton (2000), focus groups also provide some quality control. In focus group discussions the participants elicit a lot of data as they listen to one another, they feel free to talk and they engage in discussions. Issues raised in individual interviews can also be discussed in the group (Chou, 2010). In action research focus group discussions are important as it is through these that participants critique their practices, reflect, observe and plan for future actions (Bleicher, 2014; Rearick & Feldman, 1999).

In this study there were two types of group discussions: small group and whole group discussions. The small group discussions were conducted with a few teachers (3 to 4) during implementation of an agreed action in the action research cycles. There were small group meetings where teachers and researcher discussed the implementation of the project. For example, teachers teaching class 4 might have a discussion focusing on methods of teaching or preparation of teaching materials.

The whole group discussions, referred to as reflection meetings, were in the form of a meeting, where all participating teachers and the researcher discussed and reflected on what had happened in the entire action research cycle. During the reflection meetings the teachers presented their findings for discussion. The themes for further discussion emerged from the teachers' presentations and were discussed and agreed through voting. During planning there were many different aspects expressed by the teachers and the one that teachers pointed out most was

given priority to be implemented. In this respect the procedures were similar to voting.

The direction of the action research was influenced by the teachers. After discussion during the reflection meeting a summary of issues that emerged was presented and the participating teachers and the researcher voted on which issue should be pursued. The idea that had been voted for with the highest score was given priority for implementation. During whole group discussions the teachers and the researcher discussed what went well, what went wrong, what needed improvement, and how. It was in the whole group discussions where decisions were made on what to do in the next action research cycle. During the actual implementation of the action research process at Maisha Primary School, 13 whole group discussions for the participating teachers were conducted in the form of reflection meetings. The reflection meetings were one of the opportunities where the researcher could become familiarized with the context and facilitate the teachers in implementing change. They were also meant to be a control to the research process.

During the action research process focus group discussions in the form of meetings with children with VI were conducted. Altogether, there were 12 such meetings. These meetings were initiated by either the researcher or the head teacher. During the meetings the children with VI had the chance to explain what happened in the class and if they had noticed any new changes. The children were also asked what interested them in the class and what to improve so that the teaching and learning becomes more meaningful to them.

6.4.3 Observation

Observation is a method used to collect real data presented in a natural setting (Denzin & Lincoln, 2005; Flick, 2007). There is indirect and direct observation. Indirect observation is about studying respondents while they are unaware. Direct observation involves studying participants while they are aware of being observed (Corbin & Strauss, 2008). The use of the observation method allows the researcher to reveal the inter- and intra-personal variations existing in implementing a practice (Glaser & Strauss, 1967). With observation the researcher gains access to social interactions, physical activities, non-verbal cues, gestures, roles played by different actors in social settings and factors affecting the teaching or leaning process. Through observation I was able to gain access to expected and unexpected actions and the planned and unplanned actions that happened or were supposed to happen in the context (Flick, 2007). In using observation, I created a classroom observation checklist (Appendix 6). The checklist helped me to collect information like the number of times a pupil with visual impairment answered a question. Similarly, the checklist was used to observe other pupil behaviour like classroom participation, the activities performed by children and activities carried out by the teacher.

During the observations I sat at the back of the classroom observing all actions that were taking place in the class and took notes. The notes were further clarified by the teacher whose teaching I observed. After observing the class I had a discussion with the teacher on what I had observed and the teachers clarified some issues that I noted. For example, in one class observation I noticed that the teacher did not choose a child with VI to answer a question. In such a situation the teacher could give reasons for not choosing the child. For example, one teacher said the child did not raise their hand to answer the question. I then had the possibility to advise the teachers to encourage those who do not raise their hand to answer questions, especially children with VI.

Observation also added to my data set on the classroom ecology and provided me with information that could be used in triangulation with other sources of information. In doing classroom observations I became an accepted member of the school community. The teachers and the children got used to me. In the school the children were used to having guests in the classroom. In Tanzania, school inspectors observe classroom teaching. Also during teaching practice, tutors observe actual classroom teaching. I developed a level of trust among teachers and children, which facilitated other data collection techniques as both teachers and students were open and developed confidence in me. Before observing a class a discussion was held with the teacher in order to build more trust. Each teacher during classroom observation started a lesson by introducing me to the children and what I was doing. After the observation sessions the teacher and I had a discussion about what had happened in the class. Another aim with the discussion after observation was to help the teacher to reflect on the teaching session. I observed each participating teacher's teaching three times during the action research project: once in cycles 2, 3 and 4.

6.4.4 Questionnaire

The questionnaire is a research instrument that uses a series of questions to be filled in order to collect data or basic facts from individuals who are well-informed on the phenomenon being studied (De Vos, 2001). The type of questions and format in a questionnaire are determined by the type of respondents, aim of the research, size of the sample, indicated method of data collection, and the expected method of analysis of the data. In this study questionnaires were used to collect information from teachers and children.

The questions in the questionnaires (Appendix 3 to 5) were set out to elicit views from different voices about the teaching practices in the classroom. The voices included the teachers and children with VI. The teachers filled in the questionnaires themselves, whereas the children with VI completed the questionnaire with assistance from the teachers and the researcher. In the teacher questionnaires, open and closed questions focused on their background, common teaching methods used, their knowledge about teaching children with VI, facilities in the classroom, improvement needs, and the strategies used to assess and ensure the participation of children with VI were included in the

questionnaire. The teachers were also asked to give their views about facilitating teaching and learning process in a class enrolling children with VI. In all situations the respondents were not required to write their names. A total of 5 questionnaires were prepared and administered.

The questionnaires (37 children with VI in Phase 2 and 6 boys with VI in the actual action research process) for the children with VI included questions about the subjects they liked most, those they disliked most, the reasons that made them like or dislike the subject, their views and/or opinions about inclusion, choice of readers, and suggestions for improving the situation. During phase two of the study (see 6.3.2.) I also involved children without VI, but I decided not to administer any questionnaire to these children during actual implementation of the study where I used interview guides only for the purpose of eliciting more information from the children with VI through probing questions.

6.4.5 Document review

Documents were also used in this study. According to Winter (1989) document do form part of assurance on the reflexivity principle of action research as they provide factual information describing the context. Document reviews were used to supplement the interview, observation and questionnaire data (Patton, 1990; Kvale, 1996). Documents provided a historical context and the nature of school practices over time. Document data collected and analysed included school inventory, lesson plans, subject curriculum, school inspection reports, school rules, diaries, class registers, pupils' work books and pupil progress reports. School inventory included the list of teachers, available number of children by sex and type of disability, equipment, school bursary, books, desks, and classroom facilities. These data helped me to understand the context in which children with VI were enrolled.

Lesson plans are prepared by teachers. They give information about the actual classroom practices. They include the teachers' activities and the children's activities. The lesson plans are the documents that can be used to assess the involvement of the children in the lesson. The subject curriculum was used to assess the topics that present challenges to both children with VI and the teachers in the teaching and learning process. School inspection reports, on the other hand, indicated how the school created a learning environment for all children to learn.

The school documents gave me the chance as researcher to view both what is reported and what is actually happening in the classroom. I analysed all school documents related to the teaching and learning process. I also collected teacher reflection notes, my own notes, student textbooks used in primary schooling in Tanzania and notes from the head of school. Documents from teachers in the results are shown as excerpts from the teachers. Other documents reflected in the text described the school characteristics. The documents that I used most were the teachers' reflection notes, my reflection notes and the pupils' notes. Data that

I reviewed briefly were related to school management, school records and school meetings. These data were used only where needed. For example, school data were used when needed to report the number of children with visual impairment in the school, number of teachers and availability of school supplies and infrastructure.

6.5 Data analysis

Data analysis is referred to as creating meaning out of raw data (Johnson & Christensen, 2012). Data analysis involves comparing, contrasting, ordering, establishing links, speculating, creating category systems, putting together related information and identifying relationships (Strauss & Corbin, 1990; Kvale & Brinkman, 2009). As in qualitative data analysis, data analysis in action research is a continuous process throughout the whole data collection process (Richards, 2009). The data collected represented the participants' real life experiences such as the teachers' and children's actions and thinking. The meanings attached to the data were a result of co-construction through the reflection meetings and the member checks (Janesick, 2000; Merriam, 2001). The text data from the questionnaires, focus group discussions, observations and the interviews were constantly compared according to their similarities and differences, and similar texts were put together to form themes or categories of description (Patton, 1990; Creswell, 2002). These categories of description were formed after analysing and grouping similar information describing a specific phenomenon.

In action research data analysis is a continuous process (Hammond, 2013; Mertler, 2014; Tragoulia & Stroglos, 2013). Data analysis started immediately during implementation of the action research project. According to Johnson (2012), data collection in action research is a continuous process with a focus on themes and continuous seeking for what is missing. Thus, data analysis in action research paves the way toward looking for what you want to know. In this study I was investigating how best to facilitate teachers as they participate in action research to change their teaching practices and better facilitate the learning of children with VI enrolled in a regular school. In this project, data analysis was about identifying factors that indicate whether improvement was taking place and identifying reasons and/or causes for the observed improvement and/or actions.

It is during data analysis in action research where the researcher monitors the process by questioning practices leading to change. In this study during data analysis I had the opportunity to ask myself questions like: am I reflecting on issues about teaching in inclusive classrooms? How can I enhance further understanding about the phenomenon and about what is happening? Reflection on what was happening led to the choice of tool to be used for data collection. I did all the planning before implementing the action research cycle process. For example, before conducting a reflection meeting I planned for activities to be

done so that I could obtain the required information. Planned activities included type of data collection tools, the way to administer them and the way to make resolutions. The activities during reflection were meant to assess the achievement attained and plan for future improvement. In the next section I describe how I analysed the data from each data collection tool.

Data collection with questionnaires was an ongoing endeavour throughout the action research project. In the whole action research project 6 questionnaires were administered: Four to teachers and two to children. The data collected were entered into Microsoft Word and Excel files. The quantitative data were counted and put into tables with a category showing their frequency. I coloured text that represented similar categories for easy counting. Through data analysis different themes emerged indicating the existing conditions and suggested strategies for improvement. Findings from data collected using a questionnaire during the implementation of action research at Maisha Primary School were presented to teachers for discussions and making sure that all teachers are aware of the findings. The questionnaire findings during the project implementation were presented to teachers through a meeting before introducing a new intervention. After the results were presented to teachers they were discussed and decisions were made by both the teachers and me for the type of intervention to be done.

In this action research I performed observations focusing on how the children with visual impairment were engaged in the classroom activities. This was done during action research cycles 2, 3, 4 and 5. I used the observation checklist shown in appendix 6. I observed a classroom before and after the teacher interview. This was to obtain information on how the teacher described class engagement before and after applying intervention. I also interviewed children with visual impairment before and after teacher implementation of the action research cycle. Both the interviews and questionnaire were a basis for noting changes that were taking place in the school. The observation results were compared for the purpose of showing change in teacher practices before and after intervention. The comparison was done within and between the action research cycles. Within the action research cycle each teacher had an interview before and after observation. Between the action research cycles changes were compared between what happened in the two consecutive action research cycles.

Apart from questionnaire and observation, there was an interview guide which guided me in getting information from the participants while implementing the action research project. A total of four interview guides were administered. Of the four interview guides, one was for parents of children with visual impairment, two interview guides were for teachers and one interview guide for children with visual impairment. Interviews were a means to obtain feedback on what were their experiences and challenges during the teaching and learning process in the classroom. Using interviews I managed to probe teachers' and children's attitudes, engagement and progress in the action research process. I obtained children and student quotes that corresponded with both the qualitative and quantitative data collected in looking for themes, trends, and connections between interventions applied to change in attitudes, engagement and

achievement. The quotations from teachers, parents, and children added depth and the authentic voices of the participants to my research (cf Messiou, 2003).

In the whole action research process I in collaboration with the teachers examined change over time. How can teachers change teacher practices in schools enrolling children with visual impairment? In answering the question I needed to understand the existing situation so that in the end I could compare children's attitudes and engagement levels in the classroom overtime in order to measure any change that occurred. I examined the school conditions before and after the action research cycle implementations. I held reflection meetings in each action research cycle where both teachers and I had the opportunity to evaluate what had happened, what were the constraints. I also interviewed children with visual impairment before and after implementation of the action research cycle. I examined information obtained before and after implementation of the action research cycle from both teachers and children with visual impairment in order to determine whether or not the applied intervention had an impact on the children's lesson engagement and improving the children's performance.

Data analysis is about revealing characteristic elements and structure. In this study I systematically reviewed and organized the collected data. The organized and sorted data that represented a similar concept or concepts were then put together. There were instances where more than one respondent said the same thing. Where there were more data representing the same idea, I had to put the ideas together. Similar data were counted and recorded in a table to form a category system and their frequencies were indicated. Frequency is the number of times a certain concept or phrase was said by the respondents. The excerpts were referenced by the named respondent (with name changed) and the time during which the data was collected. In the report writing the same principle was maintained.

6.6 Trustworthiness of the study

In this section I discuss trustworthiness and quality of action research. Moss (2012), in referring to narrative research practice, argues that trustworthiness is both a science and a creative art. It is creative art in the sense that it calls for authenticity within research practices (Lincoln & Guba, 1985). In critical research that involves change and social action, research reports in order to be trustworthy need to be an authentic, detailed account and impartial in terms of public and professional judgment (Mattsson & Kemmis, 2007). In this action research study, I obtained trustworthiness of data through triangulation, reflexivity, and member checks. I took into account the criteria for judging action research, as set out and argued by Heikkinen, Huttunen & Syrjälä (2007). In the next section, I describe how I ensured trustworthiness in relation to the chosen criteria.

6.6.1 Trustworthiness in action research

Trustworthiness provides researchers and readers of qualitative research with a reason why the research findings are worth paying attention to. In the positivistic sense trustworthiness refers to validity and reliability in the research activity. In action research the concepts of validity and reliability are seldom used, although trustworthiness is a topical agenda in addressing quality of action research. According to Rolfe (2004), trustworthiness takes into account issues of credibility, dependability, transferability, and conformability, which are suggested by qualitative researchers as criteria for assessing the quality of qualitative research (see Bradbury & Reason, 2006; McMahon & Jefford, 2009). These quality criteria guided me as a researcher throughout the whole process, although I tried to follow the criteria and the concepts which are commonly used in the action research tradition. However, different action researchers focus on different aspects that are thought to constitute trustworthiness in action research. According to Dick (1999), criteria for trustworthiness in action research involves the following aspects: a cyclically oriented nature, the respondents as co-researchers, dialogical engagement in the process, and triangulation. On the other hand, Lennie (2006) views quality aspects of action research in terms of trust, engagement and the participation of respondents in open communication. In action research quality can be ensured by having multiple sources of data and multiple methods of data collection, referred to as triangulation. Other quality aspects of action research include reflexivity, impact assessment, participant evaluation of data analysis and reports, and a diversity of voices being represented. In this study data were collected from multiple sources and the respondents were those changing their practices in the teaching and learning process. The participants in this study had time to reflect and plan for future actions.

Other scholars like Stringer and Genat (2004) consider trustworthiness of action research studies to use the qualitative criteria described in Lincoln and Guba (1985) and Rolfe (2004), but add two other criteria; participation and utility of the results. In action research that focuses on changing practices, usability of the results is a necessary condition. This was also the case in this action research project. There are scholars who use the notion quality of action research in describing trustworthiness. I have attempted to describe the quality of my action research process using the criteria set by Heikkinen, Huttunen and Syrjälä (2007), which include the principles of historical continuity, reflexivity, dialectics, workability and evocativeness. According to Heikkinen et al. (2007), these principles were developed as a result of experiences in carrying out and supervising action research studies and studies that focus on teacher life. My study stems from teachers' experiences and teachers' lives in a rural, poorly resourced regular school where pupils with VI were included. Teachers had mixed experiences, some with knowledge of special education, others with less teaching experience and some were teachers with visual impairment, all with a vision of changing their practices to improve the learning of visually impaired

children. This context, teachers' experiences and the reflections and changes they made that had an assumed impact on the learning of the visually impaired children gave rise to the relevance for using the criteria set by Heikkinen et al. (2007). Below I describe these criteria.

Historical continuity

Historical continuity means continuation over a period of time and recognition of historical events as inseparably interconnected. In historical continuity readers make references to previous events in understanding new events. According to Heikkinen et al. (2007), historical continuity is about analysis of the history of action, that is, how action evolved and how logically and coherently the narratives proceed. In this study historical continuity goes back to the late 1990's, when inclusive education in Tanzania started to be implemented and later spread all over the country. This study is about promoting and implementing inclusive education. Historical continuity can also be seen in the process character of this study. The action research processes were documented as they proceeded from the pilot study which informed the problem and paved the way to the actual action research process.

In action research the notion of historical continuity is essential as all descriptions in one cycle are a result of previous actions done. This study had five action research cycles interwoven. To ensure historical continuity in this study I used a number of data collection techniques that included discussions in meetings, interviews, reflection meetings, focus group discussions, checklists, questionnaires and observation. These techniques were known to me as I was already using them when I was a school inspector in reporting on and judging school performance. In line with Dick (1999), the project aimed at change (action) and understanding (research). The methods used had to be flexible so that the research participants could achieve both change and understanding as the study cycle progressed. Action research followed five cycles of planning, acting, observing, reflecting and re-planning, where each action research cycle informed the next cycle of research. Dick (1999) argues that as data collection and analysis is a continuous process in action research, the later stages of action research test the earlier research cycles. In action research there is self-reflection and evaluation. The study process is described in section 6.4; with the implementation of the action research process involved using results from the previous action research process. There was continuity and change. The results in chapter 7 are presented step by step as teachers changed their practices.

Reflexivity

Reflexivity is defined by Heikkinen et al. (2007) as subjective adequacy and ontological and epistemological presumptions, which means the researcher's assumptions about reality and knowledge. It is also about the relationship between the researcher and the research participants. In this study the teachers owned the action research process and I was the facilitator in the process. However, my role was also the researcher's. My task was to study the change process. The teachers and I reflected together and made decisions together. In

ensuring this principle of reflexivity and dialectics (Feldman, 2007; Heikkinen, Huttunen & Syrjälä, 2007) in each action research cycle, the results were presented in a meeting with teachers to discuss and comment on. This was seen as a way to construct reality collaboratively.

During the actual implementation of the action research project at Maisha Primary School, the teachers were active participants in the action research process as they were changing their teaching practices as the action research proceeded. In changing practices, both teachers and I had reflection meetings. These reflection meetings presented the reality of current practices and a way forward in the next action research cycle. During this time the teachers became co-researchers, researching their practices and challenges with a vision of changing and facilitating the learning of children with VI included in regular classes. The participation of research actors in the research process is an important aspect in action research (Stringer & Genat, 2004). In this research teachers were actively involved throughout the process. It started as a second order and gradually in the action research cycle turned to first order, where teachers had more control in the research process. In phase I and II I was controlling the research process. It was just like other type of research where respondents are not taking part in improving their situation. In phase III teachers became active practitioners and I had reduced the influence to the real activity that needed to be changed the teaching practices. In this research participants were actively involved as compared to the researcher, and hence become, more of the first order. However, this did not mean that I as a researcher gave up my researcher role. I was very close to my research field and the research participants, but at the same time I had to keep a distance in order to see what was really happening.

Dialectics

According to Heikkinen et al (2007), dialectics is about dialogue, polyphony and authenticity. Dialogue focuses on whether the research results developed through dialogue with others. Polyphony is about how the researcher has presented different voices and interpretations in the report, and authenticity refers to the authenticity of the narratives (the findings as they emerge in the research report). As researcher I aimed at taking the different voices into account by listening to the voices of both the teachers and the children with VI in the data collection sessions in observation, discussions and interviews. The school context and also the cultural aspects of the school environment were seen as important aspects in the research process. I wanted to include aspects like culture, gender, disability, education and development in the core of the discussion about school-based professional development through action research. In this study multiple voices shaped the reality: teachers, children with VI, sighted children and parents (parents only in the second phase of the study). In ensuring that these different voices were heard and valued, the language used was Kiswahili, the language normally used in communication. The interviews with the teachers and children enabled me to listen to the different voices. Also

the reflection meetings gave the teachers the possibility to discuss and to reflect upon the issues voiced which fostered dialogue and authenticity.

Workability

Workability as suggested by Heikkinen et al. (2007) is also referred to as utility (Stringer & Genat, 2004). Workability is also a relevance criterion. Both refer to practical outcomes of the action research. In this study, teachers actively participated in analysing and changing their practices as a result of participating in planning, acting, observing and reflecting. The actions in each action research cycle were a result of learning and acting and reflecting on what teachers had done previously. The teachers created knowledge through reflections and received new experiences which they were able to implement in practice. The actions and knowledge produced were directly useful to the teachers (cf. Reason, 1994).

The teachers had the possibility to try out what they had learned, and it can be argued that the actions had practical relevance for the development of their teaching practices. They were able to utilize what they had learned immediately. The research group was always kept abreast of the current findings as they themselves created and used them. The findings acted as a lever for change and were used in their classroom as they implemented new innovations. These new innovations were co-created in open discussion during the reflection meetings. In that the research at every action research cycle created workable practices for teachers and children, decisions on what to do next were made through reflection meetings, and the whole idea of the research was to empower the education stakeholders the study met the criteria of workability.

Evocativeness

According to Heikkinen et al. (2007) evocativeness refers to emotions or feelings resulting from the study on the research participants. Are the research participants interested in the study and are the relations to the researcher friendly? Feelings and/or emotions are part of the evaluation criteria of other qualitative studies as well (Bridges, 2002; Patton, 1990). Emotional competence is important in all kinds of praxis-related research where the researcher is close to the research participants. In this study, both teachers and the children with VI had good feelings about the action research study. They provided their views openly and were interested in the study. I noticed their enthusiasm in the study through fulfilling what was agreed and the way they participated in the reflection meetings. The theme was appealing on the individual as well as on the school and community level. It seemed important to improve the situation of pupils with visual impairment in schools. Evocativeness is an important criterion, but the danger is that the researcher gets too friendly and starts avoiding unwelcome truths.

Especially during reflection meetings I tried to establish a friendly atmosphere and encouraged the teachers to speak freely. I pointed out several times that there are neither wrong nor correct answers. When interacting with the children

during interviews, friendliness was crucial. Tanzanian school children are often afraid of their teachers and dare not voice their opinions for fear of being punished.

6.7 Ethical aspects of the study

Ethical issues are about attributes like disclosure, creating an understanding, competence of the participants, confidentiality and informed consent to participate to the study (Bogdan & Biklen, 2007; Cowie, 1989; Field, 2004; Zeni, 1998). Ethics in action research projects are also about respect and solidarity (Kemmis & Mattsson, 2007). In this study the main focus was on teachers teaching children with visual impairment. The study started after the researcher was granted permission by the supervisor to carry out data collection and after being allowed officially in Tanzania to perform a research study by The Open University of Tanzania and the regional administration of the respective regions. The permission for conducting the study provided with me access to schools.

At the participating school I had a session with the head. When discussing with the head of school I explained the purpose of the study and gave my introduction letters to the school after introducing myself. I then asked for a possibility to interview him. The interview session lasted for about 45 minutes. Later, the head of school and I agreed to call a meeting with all the earmarked participating teachers. In the meeting I had the opportunity to disclose the purpose of the action research to the participating teachers (Zeni, 1998). I explained why I had chosen their school, why I was focusing on children with visual impairment and why I had chosen to do action research. I also explained my expected role and their roles in participating in the action research project and what were the possible benefits to them of engaging in collaborative action research (cf. Schram, 2003) like this one. The teachers had the opportunity to ask questions. All the fourteen teachers attending the meeting accepted taking part in the study. It was made clear to them that they could withdraw from the study any time they wished. However, none subsequently resigned from the study.

In the project the participants and I had a shared motive. This helped to eliminate any possible differences between us. Formal position means a lot in Tanzanian society, but I tried to establish an equal relationship with the teachers. For ensuring confidentiality participants were assured that the real name of the school and their real names would not appear in the text. We also had an open discussion in the meetings, where teachers shared their views openly. According to Cook (2010), in maintaining ethics in collaborative action research people should participate voluntarily as the action research is demanding; the researcher has to ensure the participants' comments and behaviour are kept confidential; the participating individuals have to be protected from harm, and the researcher has to ensure mutual trust with the research participants (McNiff, Lomax & Whitehead, 2003). As discussed in this chapter and elsewhere in this thesis, the

teachers participated voluntarily and I created an open discussion forum through the teachers' meetings and reflection meetings, and in the whole research report I changed the names of both people and schools.

In this chapter I have attempted to describe the method I used in conducting the action research process in this study. I have discussed the choice of action research approach, my role as researcher and facilitator and the roles of the participating teachers. The evolution of the study has also been established in terms of how schools and the respondents were selected. The methods used for data collection are described in detail in order to support transparency of the research process. In the next chapter I present the findings of the action research project at Maisha Primary School.

7 The action research project at Maisha Primary School

In this chapter I present findings from the action research project conducted at Maisha Primary School from March to September 2009. Data were collected using questionnaires for teachers and children, classroom observations, interviews with teachers and children with VI, focus group discussions (in reflection and planning meetings) and document reviews.

The action research project was conducted in five cycles presented in subchapters 7.1 - 7.5. The presentation of each cycle includes an overview, a description of the activities and the outcomes, children's voices and way forward.

7.1 Cycle 1: Identifying teachers' practices and challenges

The first cycle was implemented from 16th March, to 3rd April, 2009. The activities in this cycle included gathering basic information about the school, the teachers and the children. My aim as a researcher was to obtain an understanding of the school context. The main focus in this cycle was to facilitate teachers in developing knowledge and skills on how to identify their teaching practices and challenges.

The aim of the activities in cycle 1 was to analyse the teachers' practices and to create awareness on the impact of the practices among teachers and on the children as a basis for potential change. The idea was that teachers could change and improve their teaching practices through the process of identifying their classroom practices and challenges. The analysis of the activities and the outcomes of cycle one indicated that teachers, when facilitated, were able to develop skills and abilities to explore their teaching practices and challenges. This could be seen in the analysis of the outcomes. There were differences in the challenges teachers wrote down in the first questionnaire compared with the challenges mentioned during the reflection meetings when they presented results on their practice on identifying their challenges. An overview of the activities of the teachers and the researcher in cycle one is presented in Table 5.

My main aim as a researcher was to study how change could be facilitated. In order to reach this aim, I conducted four meetings and collected information concerning teaching practices and challenges by a questionnaire, interviews and through discussions in the meetings. Although the activities in cycle one were

planned by me, the teachers had an active role in identifying challenges in order to change their practices.

During the first part of the cycle, I spent five days in the school (16 – 20.3) interviewing the head of school, arranging three meetings and collecting data by a questionnaire and interviews, as described in Table 5. The choice of three meetings and the teacher interviews were based on the idea that in the initial stages of changing practices, active and ongoing support for the teachers individually and in groups would be necessary. My intention was to make the teachers active in implementing the project ideas and creating awareness for improving their teaching practices.

The first meeting with the teachers was held in order to introduce the action research project and to distribute questionnaire forms for the teachers to fill in. In the second meeting, two days later, I presented findings from the questionnaires for discussion and for planning the way forward. The answers in the questionnaires revealed that the teachers were facing challenges in their teaching in classes in which children with VI were enrolled. In this meeting it was agreed that teachers would start exploring their teaching practices and challenges in the teaching and learning process. In the third meeting the teachers presented their initial findings. In this meeting we also agreed that all the teachers would continue to explore the teaching practices and challenges they face in teaching of their specific subjects in classes where children with VI were included.

Table 5. Overview of activities in cycle one

Activity	Dates	Teachers	Researcher
Interview with the head of school and reviewing school documents	16 – 20.3		×
First meeting with teachers	16.3	×	×
Analyzing the questionnaires	17.3		×
Planning meeting with teachers	18 .3	×	×
Teachers exploring their practices and challenges	18 -20.3	×	
Interview with teachers	18 – 20.3		×
Interview with VI- children	19 -20 .3		×
Meeting with teachers	20 .3	×	×
Teachers exploring their practices and challenges	21.3 -3.4	×	
Interview with children with VI	2.4		×
Reflection and re-planning meeting	3.4	×	×

In the second part of the cycle (21.3 -2.4) the teachers were left on their own with instructions to continue to observe, reflect and explore their teaching practices and the challenges they faced in their subjects. After this period I visited the school again for a reflection and discussion meeting (3.4). This concluding meeting marked the end of cycle one. I also interviewed the children with VI. Based on the findings and the teachers' reflections, the focus in the

meeting was also on planning activities for the following cycle. In that respect this meeting was also an introduction to cycle two.

In the next sections (7.1.1-7.1.3) I present findings on the way teachers were starting to change their teaching practices and challenges based on the questionnaire, the interviews with teachers and children with VI and the focus group discussions in the reflection and planning meetings with the teachers. All 14 teachers answered the questionnaire, were interviewed individually by the researcher and attended the meetings. In addition, all six children with VI were interviewed (4 in class IV and 2 in class VI).

7.1.1 Teachers' practices and support strategies

In the questionnaire, the teachers were asked to describe the teaching practices they used in their classes. All the teachers used *question and answer* and *group discussion*. A few teachers used other methods, such as *lecture, demonstration, brainstorming* and *study tours* in their teaching. Methods and frequencies are presented in Table 6.

Table 6. Teaching methods used by teachers (frequencies)

Teaching Method	Number of Teachers
Question and answer	14
Group discussion	14
Lecture	5
Demonstration	4
Brainstorming	4
Study tour	3

Source: Questionnaire, March 2009

As the main focus of the study was on how to facilitate the learning of children with VI enrolled in regular schools, the teachers were asked to describe not only the teaching practices they used but also their experiences of how they supported these children in their classes. The teachers used various support strategies in order to include children with VI in their teaching and learning process. According to the summarized data (Table 7), there were a number of different support strategies that teachers used to support children with VI. Most of the teachers used two or three different support strategies.

Table 7. Support strategies for children with VI (frequencies)

Support strategy	Number of Teachers
Encourage pupils to ask questions	6
Encourage pupils to answer questions	3
Encourage pupils to participate in group discussion	3
Provide more explanations	3
Provide extra exercises	2
Use of tactile teaching materials	4
Giving priority to touch	2
Use of Braille printed text	2
Seating arrangements sitting in front of the class	4
Use IEP	2

Source: Questionnaire, March 2009

According to the teacher responses on support strategies teachers used more of the "one-size-fits-all" styles as there was little consideration given on how to support children with VI. The most common support strategy was to *encourage pupils to ask questions* which is a strategy commonly used in regular school classes. In Table 8 individual teacher data are presented. All of the teachers used more than one teaching method and about half of the teachers used more than two teaching methods. Two of the teachers used a large variety of teaching methods. No substantial differences between the teacher categories could be noticed. Of those teachers using most teaching methods, one was a regular teacher and the other a teacher trained in special education.

Almost every teacher gave some kind of special support (Table 8). The presented data are based on teacher interviews and statements obtained from discussions in the meetings with the teachers. I illustrate the findings with excerpts from data. More than half of the teachers tried to facilitate learning by *encouraging the children to ask and answer questions*. In focusing on the VI-child, they called the child by name.

> I help children with VI through questions and answer. When asking questions or requiring them to answer questions I am used to call them by name. I also encourage them to ask questions and answer questions when in group discussion. Answering questions assures me that they are listening. I give them explanation on the topic I teach and it is for them to ask questions so that I answer them. [Edina, reflection meeting, March 2009]

> I encourage children with VI to answer questions. If they (children with VI) do not, I ask them questions as sometimes it is difficult for them to ask questions. Asking questions helps me to understand the level of understanding of my children. You know children with VI need *more explanations* as compared to sighted children as they use tactile sense, whereas others can use sight. I have no proper skills in enhancing use of sense of touch among children with VI. During teaching and learning children with VI are not involved because teachers do not know how to encourage in answering questions. Teachers do not know how to manage children with VI learning styles when included in regular classroom in their teaching and learning process. [Esta, reflection meeting, April 2009]

All teachers used *group discussion* as a teaching method. It was used during lesson presentation by teachers when presenting a topic for discussion. The teachers encouraged both the children with VI and their peers to get involved in the discussions. As children with VI use listening skills, discussion gives them an opportunity to learn more and ask where they do not understand. Discussion in groups with children with VI was also held in their resource room. The discussions gave the children with VI a chance to review their written notes and to receive more explanations about lessons from their peers. To the teachers, the discussion method both in and outside the classroom provided a chance for students to do revision and develop some thinking skills which were considered important for improving children's achievement. Baraka, a teacher with VI, explained how he uses group discussions.

> I encourage children with VI to participate in group discussions. I find it is a way of supporting their learning. In a group I ask peers to fully involve them. During discussion group sessions I pass through as a way to monitor involvement of all children and get explanation from sighted peers on how children with VI participate. This is a way to measure whether or not children with VI are involved. In order to learn better, children with VI need more explanations. [Baraka, interview, March 2009]

Table 8. Teaching methods and support strategies for children with VI

Name	Teaching methods						Support strategies for children with VI									
	Question and answer	Lecture	Discussion group	Demonstration	Study tour	Brainstorming	Encourage to ask questions	Encourage to answer questions	Encourage to participate in group discussion	Provide more explanations	Provide extra exercises	Use tactile e materials	Giving priority to touch	Use Braille print texts	Place children with low vision in front of the class	Use IEP
Agnita	×		×													
Amos *	×		×				×			×						
Antonia	×	×	×	×	×	×								×	×	
Baraka*	×	×	×	×		×	×		×						×	
Benjamin	×		×									×	×			
Betty	×		×				×			×						
Boni	×		×									×		×		
Clara	×	×	×					×				×	×			
Edina	×		×	×	×	×	×	×	×							
Esta	×	×	×				×				×					
Herena	×		×											×	×	
Mercy **	×		×													×
Mselem**	×	×	×	×	×	×	×	×	×	×	×	×		×	×	×
Msigalila	×		×											×	×	

* Teachers with visual impairment

** Teachers trained in special education

Source: Field data (March 2009)

According to some teachers, children with VI were expected to require more *explanations* as they experience their world through touch and listening. As a result, more teachers used question and answer and group discussion as a way to provide a chance of having explanations from teachers and peers through group discussion. Children with VI in the classroom access the curriculum through listening. They also need more training; thus, *extra exercises* were used by two of the teachers.

> I explain more about the topic to children with VI. To me it is difficult to know whether they have understood or not. In this case, I have to explain to them and guide their learning. I provide extra exercises to give them chances to practice. I feel if they practice they learn. The sighted children would consult books, but the visually impaired would just need to practice what you taught in the class. As they practice they gain confidence and discover a new way of solving a similar problem.[Betty, interview, March 2009]

There were four teachers who used *tactile teaching materials* in facilitating the learning of children with VI. Use of tactile materials was highlighted during the interviews and in the meetings. Two teachers, Clara and Benjamin, pointed out that they gave the children with VI *priority to touch* the tactile and/or concrete material when available and used. They felt that tactile teaching materials would support the children to learn and understand concepts better. The teachers thought that if they wrote regular print words on a manila sheet and made them tactile by gluing them with hard materials such as sand or a thread, children with VI would understand. According to Mselem, concrete teaching materials without Braille labels caused confusion to children with VI.

> If I happen to have a teaching aid I give the children with VI first priority to touch it so that they understand the concept. I allow them to touch normal print words or numbers. I make teaching aids for children with VI to use. [Benjamin, questionnaire, March 2009]

> When children are given a teaching material without a Braille label, they cannot understand. They will enjoy touching as they will be exploring in order to understand what they represent. To learn better, children with VI like sighted children, require proper labeling of teaching materials. [Mselem, interview, March 2009]

Benjamin, as a trained regular teacher, espoused the idea that teaching materials and equipment supported children in learning new ideas and facts, although he pointed out that during his initial teacher education program he was not trained in preparing learning materials for the blind. However, he was trying to prepare some material for the children with VI to use. Also the head of school, Mselem, made efforts to prepare teaching materials for all children.

The availability of *text in Braille* was very restricted. It was largely dependent on the initiatives of individual teachers and the willingness and possibility of those teachers who had Braille print skills to help. Visually impaired teachers in the school were asked by some of the teachers to support by writing texts in Braille. (There were altogether six teachers with VI in the school).The questionnaire responses indicated that five of the teachers in the study provided Braille printed texts for their children. None of the teachers talked about providing large print for children with low vision included in their classes. Of the 6 children with VI, 2 were diagnosed with low vision and 4 were totally blind. Antonia explained that Braille text helped when she wrote notes for others to copy on the chalkboard and during reading lessons.

> In my own arrangements sometimes I ask a teacher with visual impairment to print in Braille some parts of the topics that are difficult for them. You know I teach English, and sometimes it is difficult to pronounce a word. [Antonia, interview, March 2009]

Five of the fourteen teachers described that they rearranged the classroom seating according to the needs of children with low vision. These children sat at the front of the class. None of the teachers talked about the seating arrangement of their blind children. The school had large and overcrowded class sizes (more than 70 children in a class meant for 45 children) and frontal seating arrangement was usually used. All the children sat in rows facing the teacher in

front of the classroom. Antonia, an English teacher, described how she used seating arrangements for children with low vision.

> I ask those with low vision to sit at the front of the classroom so that they can see what I write on the chalkboard. I feel that if they sat at the back of the classroom they could not be assisted to engage in the teaching and learning process and would be distracted by others. Such a seating arrangement is likely to hinder their learning. When seated in-front there is times I provide them with a book to read a passage from. When I use teaching material I give them first priority to see it [Antonia, interview, March 2009]

There was limited use *of individual educational plans (IEP)* in the school. During analyzing data from questionnaires in which teachers were asked about support they provided to children with VI, only the teachers with training in special education mentioned the use of IEP. Mercy, a special education teacher, described that it was necessary to use IEPs as basis for teaching children with VI. Based on IEP, the children were taught study skills, the use of Braille, communication and social skills.

> You know without IEP for children with VI it could be difficult for them to cope with their studies. In providing IEP, we teach the functional skills, communication, mobility and use of Braille machine and the white cane. They learn how to read Braille print, social skills and some study skills. The problem with other teachers who cannot make modifications in their lessons is that they are not trained in special education. I learned IEP skills at Patandi teachers college [Mercy, interview, March 2009]

To sum up, the data indicated the use of a variety of lesson presentation strategies and special support strategies in facilitating the learning of all children in the school. Almost all teachers provided some kind of support for children with VI. The teachers seemed to have varied knowledge, understanding and orientation about facilitating the learning of children with VI. A few teachers used strategies related to visual impairment, such as tactile materials, IEPs or Braille prints. There were some teachers who provided extra exercises or explanations. However, the teachers did not seem to have shared their knowledge and skills with each other as there was no common support strategy used.

Apart from analysing teacher practices (teaching methods and support strategies), the focus in the first cycle was on the challenges the teachers faced in their teaching. The challenges are presented in the next section.

7.1.2 Teachers' challenges and proposed solutions

In the questionnaire teachers were asked to list challenges they faced in their teaching. The main challenges listed were related to *teaching materials* and *equipment* (Table 9).

Table 9. Teachers' challenges (frequencies)

Challenge	Number of teachers
Teaching materials	8
Equipment	7
Lesson presentation	4
Choice of a teaching strategy	4
Teaching reading	3
Shortages of experts in Braille	3
Lesson evaluation	3
Teaching writing skills	1

Source: Questionnaire, March 2009

According to the teachers the challenges regarding *teaching materials and equipment* were related to availability and use. The schools had few resources (Chapter 6.3.3) and also teachers indicated they had few skills and little knowledge with respect to supporting children with VI (Chapter 6.3.4).

> Challenges I face in teaching a class that include sighted and visually impaired children include shortage of books, shortages of teaching materials and shortages of Braille papers for printing Braille text. The shortage of books has increased, as since we started the new syllabus in 2005 there is not even a single copy of a primary book printed in Braille text in our school. In the previous syllabus we had specific books to use, so we had a few copies of Braille print text, which cannot be used in the current syllabus. Children with VI therefore depend entirely on the teacher's notes. [Anita, questionnaire March, 2009]

In the case of *how to teach* teachers were challenged on how to present lessons. They all had skills in presenting lessons to sighted children and there were cases where teachers could give an assignment to read a certain part of a text and later answer questions related to the read text. In some of the cases teachers presented lessons using visual teaching materials. Teachers were also challenged in presenting lessons that require children to develop reading and writing skills. This was a challenge when a topic is about silent reading. There were challenges also in assessing children's achievement in reading and writing.

> I feel challenged in teaching a class that includes a child with VI because I cannot read Braille print text and the school does not have Braille print text books. In presenting lessons I feel challenged as I am used to saying 'please look at the chalkboard', 'read this sentence', and 'what do you see on the chalk board'. The other challenges are in how to assess children's progress in different skills development including reading, writing, arithmetic skills and drawing skills. [Antonia, interview, March 2009]

Because the study was focused on improving the learning of children with VI, teachers were also asked to give their views on what they thought would be the solution to the challenges they faced (Table 10). The most common solutions were related to *preparation of teaching materials* and *supply of Braille printed materials*. However, *professional development* and *modification of the school environment* were proposed as solutions not directly related to teaching.

Table 10. Teachers' proposed solutions (frequencies)

Proposed Solution	Number of teachers
Preparation of teaching materials	7
Supply of Braille print materials	7
Professional development	5
Modify school environment	3
Employ experts in Braille	3

Source: Questionnaire, March 2009

In Table 11individual teacher data are presented. All of the teachers reported challenges, mostly related to materials and equipment. Most of the teachers identified a few challenges and there were no substantial differences between the teacher categories. All teachers except one were able to propose solutions to the identified challenges. The solutions were linked to the challenges as most of the teachers who faced material and equipment related challenges also proposed solutions related to the preparation of teaching material and Braille printed material. Professional development was proposed by the two teachers with visual impairment and the two special education teachers. The special education teachers also proposed modifications to the school environment as a solution to the identified challenges.

Table 11. Teachers' challenges and proposed solutions

Name	Teachers challenges								Proposed solutions to the challenges				
	Teaching materials	Equipment	Lesson presentation	Choosing teaching strategy	Teaching reading	Employ experts in Braille	Lesson evaluation	Teaching writing skills	Preparing teaching materials	Supply of Braille print materials	Professional development	Modify school environment	Employ experts in Braille
Agnita							×						
Amos *	×	×								×	×		
Antonia			×	×					×	×			
Baraka*	×	×					×			×	×	×	
Benjamin	×	×							×				
Betty			×	×						×	×		
Boni	×	×		×		×				×	×		
Clara	×	×							×				
Edina	×												×
Esta	×								×				
Herena	×		×	×		×	×		×				
Mercy **		×			×				×			×	×
Mselem**		×	×		×	×			×	×	×	×	
Msigalila					×			×		×			

* Teachers with visual impairment

** Teachers trained in special education

Source: Questionnaire March, 2009

Based on the questionnaire and interview data, it could be concluded that the most relevant topics the teachers brought up were related to challenges in teaching children with VI in regular classes. Thus, these challenges were one important area for further investigation in the action research project. In the meeting on March 20th it was agreed that the teachers during their independent teaching period should continue to focus on the teaching related challenges and possible solutions, especially in their teaching subjects. In the reflection meeting on April 3rdthese topics were discussed.

7.1.3 The teachers' reflections in implementing cycle 1

During the independent teaching period (21.3 – 2.4) the teachers were asked to identify challenges they faced during the teaching and learning process in their specific teaching subjects. They were also asked to think about possible solutions to the subject specific challenges. The teachers were given note books to record problems they faced. In the reflection meeting (April 3rd) the teachers presented their findings and reflections after having actively explored the challenges they faced during the teaching and learning process in classes including children with VI. In the meeting the teachers listed the following as challenges that needed to be addressed: availability of teaching materials, knowledge and skills about teaching methods, strategies and assessment, skills to manage classes including children with VI, knowledge and skills about teaching specific topics in their subjects and the availability of time to collaborate and share experiences with fellow teachers. These challenges tell of the experience of a large teacher workload, large class sizes and shortages of classroom facilities suitable for children with VI. These were also seen as barriers to learning. On the whole, there were some qualitative differences between the challenges teachers indicated when they were answering questions in the questionnaire (Table 9,10,11) compared to the views the teachers expressed in the final reflection meeting. This indicates that teachers learnt how to reflect upon their teaching and to explore their teaching practices in a more systematic way. This was seen as a step towards changing their teaching practices.

After having had small and whole group discussions in the reflection meeting the teachers reported and summarized the following challenges in teaching classes where children with VI were included:

- limited knowledge and skills in facilitating learning in specific teaching subjects
- limited supply of teaching and learning materials
- limited choice of teaching methods and strategies
- problems of school environment and personnel

The challenges as well as the connected proposed solutions are presented in the following paragraphs. These findings are based on data from the final reflection

meeting where the teachers had the opportunity to discuss what happened in the entire first action research cycle.

Limited knowledge and skills in facilitating learning in specific teaching subjects

The subject specific challenges the teachers identified are summarized and exemplified in Table 12. The challenges were related to how to teach different subjects without having sufficient knowledge and skills about educational adaptations. It seemed difficult to choose suitable instructional strategies. Teachers during their independent exploring of challenges they face in their teaching identified a number of challenges.

Table 12. Challenges teachers faced in specific subject teaching

Subject	Teacher's challenges
Civics and History	Drawing organizational charts of different kinds for national and regional governance, village readers, family leadership and section leadership; money; drawing national symbols; money; explaining national boundaries, teaching pictorial representations and drawing different figures.
English	Teaching making sentences from a substitution table, teaching matching items, teaching reading, appointing readers for visually impaired children, teaching silent reading, teaching capital letters, and explaining about the pronunciation of words e.g 'gh', 'th', use pictures to form sentences
Geography	Teaching map reading, boundaries, drawing a map
Haiba na Michezo	Teaching about running and jumping. Teaching sports, physical exercises, playing football
Kiswahili	Teaching how to make sentences from a picture, writing an essay basing on a given picture, riddles [Vitendawili], silent reading, pronouncing words with 'ngh, th,ng', use pictures to form sentences
Mathematics	Teaching significant figures, long division, algebra, histograms, coordinate geometry, ratio, graphing, geometry, figures, multiplication, and counting
Science	Drawing science figures, teaching different body systems, for example the excretory system, respiratory system, digestive system, cardiovascular system and reproductive system
Stadi za Kazi[16]	Teaching cooking, molding, needle work

Source: Teachers' journals and the reflection meeting (April, 2009)

The teachers reported that they lacked knowledge and skills in teaching pupils with VI and therefore proposed professional development courses. One of the

[16] Stadi za kazi according to Höjlund (2006) is a vocational skills subject introduced in the primary school curriculum in 1995. The study is about adaptation of primary education to developing needs: learning and using skills and concepts in and out-of-school in Tanzania primary education. It is treated as a school subject and the teaching approach is the same as any other subject.

teachers with VI noted the importance of orientation for teachers in facilitating the learning of children with VI because it was important to be able to determine and address their needs. The teacher said that understanding the children's needs was even more important than just preparing the teaching materials. According to Baraka, some form of professional development was needed in order to sensitize the teachers of the importance of preparing and using the right teaching materials.

> There is a need to have professional development courses that will impart regular teachers with skills to support diverse learners. The syllabus and method of assessment has remained in favouring those without special educational needs. No guidelines for handling diverse classroom are given. We are told go and teach a period of 40 minutes. However, understanding their needs is even important than just preparing teaching materials. Without knowledge and skills there are possibilities of preparing materials that are useless. School inspectors during their inspection insist on preparation and the use of teaching materials like models, but none of the inspectors have ever questioned how visually impaired children benefit from such a teaching aid/resources used in teaching-learning process[Baraka, reflection meeting, April 2009]

Based on the findings it could be concluded that the teachers were aware of the fact that they needed more knowledge and skills in order to teach children with VI. They could identify their subject specific challenges but needed to gain access to tools that could improve the situation. School-based professional development was suggested to be one of the solutions.

Limited supply of teaching and learning materials

The teachers described the limited amount of proper teaching materials as a barrier to improving teaching practices aimed at facilitating the learning of children with VI enrolled in Maisha Primary School. They also said that they lacked knowledge in using accessible teaching materials and in using equipment for preparing material specifically for children with VI. Some teachers described the problems in general terms and some produced subject specific descriptions. Many of the suggestions for improvement were naturally also related to the problems experienced with teaching material. The teachers said that the school had no Braille print books and there were no teacher guide for teachers in teaching children with VI. The available Braille print books were related to the old primary school syllabus. The school had not received Braille print books for the new primary school syllabus which started being implemented in 2005. The teachers pointed out that the change of syllabus should be accompanied by instructional material for both sighted children and children with VI. Edina, Geography teacher and Msigalila, Mathematics teacher commented on this in the following way.

> Teaching materials are meant for the sighted children. For example maps, drawings in books, print and fonts do not allow a child with visual impairment to read. Use of chalkboard also is not user friendly to children with VI, the challenge is that the teacher has to prepare two types of teaching materials, tactile and non-tactile, and remember the teacher has to cover the syllabus. We lack teaching materials and

> equipment for drawing maps because it is difficult for children with VI to draw and read maps. [Edina, reflection meeting, April 2009]
>
> I do not have the necessary teaching materials that would assist me in facilitating the learning of mathematical concepts, especially for children with VI….Without teaching materials teaching become difficult and boring [Msigalila, reflection meeting, April 2009]

The limited supply of teaching materials and the teachers' inability to prepare and use teaching materials resulted in difficulties in facilitating the learning of children with VI. Teachers experienced a challenge also in using the available assistive technologies like Braille machine and magnifiers. In the case of Braille materials, teachers were assisted by experts in Braille reading, but the problem was that there were only a few teachers who could read Braille. These teachers were not available all the time. This caused difficulties for the teachers when it came to correcting the assignments that the children with VI had made as transcribing from Braille print took time. The assignments of the sighted children were corrected during lesson time, but not the assignments of the children with VI as there was nobody in the class who could read the assignments written in Braille. A consequence of this was that the children with VI made mistakes as there was nobody there to correct them.

> There is a shortage of teaching materials, children with VI cannot read Kiswahili language fluently as a result of transcribing from the readers, especially words with more than one character such as *'ng, ng', nz*, and *ng'h*. It is difficult for children with VI to tell a story from a picture as they do not see it. There are shortages of text magnifying equipment for children with low vision and those with albinism. There are also shortages of drawing equipment in science subjects. The teaching materials for children with disabilities do not follow the change of curriculum; for example, the new curriculum started being implemented from 2005 and to date (2009) there are no teaching materials prepared for pupils with visual impairment. We do not have knowledge and skills in preparing teaching materials and how to use the materials during the teaching and learning process and as a result our teaching strategies favours sighted children [Antonia, reflection meeting, April 2009]

As can be seen from the quotation, teaching material for children with VI was practically non-existent. Curriculum changes had not improved the situation. On the contrary, the situation was even worse since no adapted teaching material for pupils with VI followed the change of curriculum. This was a big problem for the teachers. To prepare own material was seen as a solution, but the teachers reported that they lacked sufficient knowledge of and skills in how to prepare the material. The teachers had to find some strategies in how to deliver content to children with VI so that they could answer examination questions. Some of the strategies teachers used were to encourage parents to buy books for their children. However, this strategy did not work well for the children with VI, only for the sighted children. There were no bookshops selling Braille print text and reference books. In most cases parents would have no possibility to buy such books, even if there were Braille printed books on the market. In a situation where there were no books the children with VI were depending on their sighted peers to read to them.

> I have encouraged parents to buy books for their children, but for the visually impaired children there is no bookshop selling their books and the sighted children read to them. As they will later do a similar examination, I find it good to expose them to different types of learning materials. There are times when sighted children get more current books than I use. You know with the open book system each publisher publishes a different kind of text book for the same class. Thus, when having a variety of books you stand a better chance of being exposed to different learning tasks and ways of clarifying concepts [Edina, reflection meeting, March 2009].

The teachers were aware of the importance of teaching material for the children with VI, but one of the big problems they faced was lack of financial resources. Money was needed to buy equipment for preparing the teaching materials, assistive devices, travel, and health services. The school was only supported with transport and food for the children and got no funds for buying material. The school did not have enough money to buy the needed materials for teachers to prepare tactile teaching materials.

Another challenge was time. The teachers had difficulties in finding time for preparing material as they had a fixed time to cover the syllabus. The teachers' solution to this problem was that the government should take responsibility and set a budget for tactile teaching materials and assistive devices for children with VI. That could release time for the teachers to plan the best ways to facilitate learning of children with VI and to learn to use assistive devices, like Braille.

> It is better for the government to set a budget for teaching materials, food, transport and assistive devices for children with VI. This will reduce the time used by teachers to prepare tactile teaching materials or would be an incentive to teachers [Amos, reflection meeting, March 2009]

> The budget now goes higher as teachers are demanding money to buy tools for constructing teaching resources. Currently the school is supported in providing food and transport for children with VI. I now feel a need to propose a budget to also include teaching materials for children with VI [Mercy, reflection meeting, March 2009].

After discussions in the reflection meeting it became evident that lack of equipment and materials that could support the learning of the children with VI was a big challenge. Since the school had no money for buying books and other teaching material and equipment necessary to support teachers in teaching classes including children with VI. Teachers thought of preparing the material themselves, but the problem was lack of knowledge, skills, time and money.

> It is better to prepare tactile teaching materials in order to improve teaching and learning in our school because most of the needed materials are available within our environment, for example when preparing a tactile map we might need to draw a map using pieces of maize, millet, rice or gravel. The challenges in preparing tactile teaching materials are related to how to prepare and use them in a class including children with VI [Edina, reflection meeting, March, 2009]

The challenge for the teachers seemed to be that they did not know whether the children with VI were able to learn the subjects taught. The teachers used those

methods they had learnt during their teacher training. To the teachers learning was measured through the passing of examinations. The teachers felt that they had inadequate skills in fulfilling their responsibility to make children with VI acquire the needed skills in answering examination questions. They also pointed out that they did not have the required knowledge and skills in managing classes which included children with VI.

> To the children with VI if I use a demonstration method during lesson presentation it is difficult for them to understand as they cannot see… I face difficulties in choosing teaching strategies to be used when teaching map reading or drawing a sketch map as children with VI cannot draw and read maps. I need skills in choosing a special teaching method to support children with VI. If you decide to take more time to support them you cannot finish the syllabus [Clara, reflection meeting, March, 2009]

Many teachers in the school *lacked knowledge and skills* with respect to visual impairment, as well as knowledge about teaching methods, existing materials and how to prepare tactile materials to be used in facilitating the learning of children with VI. As explained in section 6.5 the teachers were trained as ordinary teachers. Many of the teachers during their early education, secondary education and teacher education did not receive knowledge about visual impairment. Some of the teachers learned about visual impairment for the first time when posted to teach at Maisha Primary School. The teachers lacked knowledge about understanding the needs of children with VI and even more so about preparing teaching materials suitable for these children.

> Preparation of tactile teaching materials takes much time, and as you know we have fixed time in a day. This is apart from the time I require to seek guidance from other persons. You know I am not trained in special education. I know nothing about tactile teaching materials for the visually impaired learner. I need support from people with knowledge in special education. After discussion with experts I need to design them. I have to teach four different classes a day and three different lessons. In short, I am sort of facing problems, though I am doing it now. [Antonia, reflection meeting, March 2009]

As a result of not having knowledge about visual impairment, teachers also lacked knowledge on selecting appropriate teaching methods that would facilitate the learning of children with VI.

> Most of the teachers have not attended a course in handling children with disabilities included in their classes. They lack skills in preparing and using resources. We have one non-teaching staff supporting children in their dormitory. She also prepares food for the children. [Benjamin, reflection meeting, March 2009]

Limited choice in teaching methods and strategies

The teachers indicated that they had few choices of different teaching methods or that they lacked the needed knowledge and skills about teaching methods and strategies when they had children with VI enrolled in their classes. Some of the teachers learned about visual impairment for the first time when posted to teach at Maisha Primary School. Most of the teachers lacked knowledge about understanding the needs of children with VI and about preparing teaching

materials suitable for them. As a result of not having knowledge about visual impairment, the teachers lacked knowledge about selecting appropriate teaching methods that would facilitate the learning of children with VI.

> I feel I have problems when it comes to preparing tactile teaching materials. I am trained as a regular teacher and do not have knowledge and skills about teaching with disabilities. I am told that children with disabilities are taught in special schools [Antonia, reflection meeting, March 2009]

The choice of teaching method was related to estimating the time needed to complete the syllabus. Teachers viewed to have less time to support VI-learning as they were required to complete the syllabus according to a fixed timetable. When using time for supporting the children with VI the teachers had problems in finishing the syllabus. They lacked knowledge and skills needed in making children with VI participate in answering questions during lessons. The teachers faced challenges in selecting a suitable teaching strategy that facilitated the learning of both sighted children and those children with VI included in the classroom. One of the teachers claimed that if she could use a strategy that helped the sighted children to learn better, the children with VI could also benefit from this as the sighted children could support their fellow pupils with VI. Two teachers, Antonia and Edina, talked about the challenge of the teaching method.

> I do not know how to manage children with VI included in mainstream classroom in the teaching and learning process. I do not know how to involve them in question and answer. When I mention a name when asking questions, all other children feel it is directed to a specific child. If I spent more time explaining, I will not finish the syllabus. [Antonia, reflection meeting, March 2009]

> As there are no teacher guides for teaching children with VI in classes, I plan my lesson and teach the way I was trained. I know how to prepare teaching materials for sighted persons. I therefore prepare what I need for teaching and try to teach in the best way possible. I believe at the end of a lesson if sighted children learned, they will support their peers who are visually impaired. [Edina, reflection meeting, March 2009]

Some teachers described problems related to lesson presentation and evaluation in general and in specific subjects. The teachers described that they presented and evaluated the lessons as they were trained during their initial teacher education, although they seemed to be aware of the problems the children with VI were facing in the classroom.

> My challenge is how to explain so that all children in the class understand the content I teach. The use of the blackboard does not involve children with VI in learning. Teaching mathematics to these children seems to challenge me a lot. I am used to teaching using the writing board in mathematics. Sayings like take this, add this to that are common and sometimes assume this angle, changing this style of teaching seems to be difficult [Boni, reflection meeting, March 2009].

> During teaching a geography lesson I face challenges in presenting map reading to children with VI. Drawings in the science subjects' do pose challenges when teaching children with VI. In evaluating a lesson the challenges are how to provide

> exercises to children with VI and to get feedback during the lesson…. You know they use Braille print and I cannot read it. [Betty, reflection meeting, March 2009]

Some of the teachers explained in detail what kind of challenges they faced in teaching specific skills related to reading, writing, and drawing. They were concerned about how to teach e.g. spelling and making sentences from a substitution table. The sighted children did the exercises on their writing boards. The challenge was how to teach and support the children with VI when they could not see what was written on the board. Some teachers also pointed out that the curriculum did not specify topics for children with VI and that no teaching guide existed.

> In my class where I teach English, children with VI cannot make sentences as the sighted peers using a substitution table or by being given a picture. [Clara, reflection meeting, March 2009]

> In the case of language subjects sighted peers who support them in most cases are unable to pronounce correct Kiswahili and English letters. I think this might be a cause for the inability of children with VI to write English letters correctly. Even in Kiswahili they are unable to write words correctly that combine two or more letters like *–th, ng'h*, children and tama*th*ali. This results in children with VI lagging behind their peers in writing Kiswahili language letters. In teaching language subjects there are times we ask students to make sentences from a substitution table and sometimes from a given picture that represents something. It becomes difficult for children with VI to make any sentence. Similarly, we have a lesson in Kiswahili about teaching how to write Kiswahili letters and the challenge is how to help children with VI to write Kiswahili letters correctly. [Antonia, reflection meeting, March 2009]

The syllabus was a challenge, not only with regard to the time available for completing it, but also the implementation of the syllabus was not easy as there was no educational adaptations for children with VI. In Tanzania teachers follow a syllabus prepared by the Tanzania Institute of Education (TIE). Teachers were unaware of what to do when implementing parts of the syllabus which caused problems for learners with special needs. For instance, to learn to write legibly was a requirement which the children with VI could not accomplish. These children were expected to learn the same things in the same way as their sighted peers. The children with VI had only one learning channel, hearing, and if the teachers did not take this into account then these children were not even given a chance to learn. Some of the teachers talked about these challenges in the reflection meeting. Boni's comment is an example of this.

> It is difficult to manage a class when teaching writing, map reading and drawing maps in a class that include children with VI, especially how to structure the class and how to provide lesson activities for children with VI. The curriculum does not specify topics to be taught to children with VI. In my case I normally provide A4 frames and ask them to write and later find someone to read for me. There are no short courses in Braille. There are no teacher guides that explain how to support a child with visual impairment included in an ordinary class and there are also no teaching materials. I think professional development courses might help teachers to improvise teaching materials. [Boni, reflection meeting, April 2009]

Teachers were of the view that using a variety of teaching methods and strategies was necessary. However, they did not know how to teach classes with visually impaired learners. No teaching guides were available; the teaching guide provided by the Tanzania Institute of Education, which all teachers used, stipulated different methods and strategies for teaching sighted pupils only. Keeping in mind that the school had no material and no resources, the challenges the teachers faced were huge.

Problems of school environment and personnel

In planning the school environment and the recruitment of personnel, it is obvious that children with disabilities have not been included in the plans. In most cases the persons considered in the education plans in Tanzania are sighted individuals without any special learning needs. The school curriculum, the teachers skills and knowledge, the Education Act, the educational policy and the school timetabling all favours individuals without special needs and disabilities. This fact resulted in problems at the school and classroom level. These topics were discussed in the reflection meeting. In the reflection meeting the teachers agreed that the school infrastructure: buildings, school landscaping, paving, furniture and school equipment were meant for sighted children, not for children with VI. The school environment was not friendly for children with VI and was seen as a barrier to the active participation of children with VI. This also affected the learning of children with VI. Also the lack of manpower was a challenge according to the head teacher.

> The school environment is meant for sighted pupils …it is important to build infrastructure necessary for children with disabilities to help them become more independent. In schools like this manpower is needed to support children in the dormitory and in collecting the necessary materials for them to read in order to answer assignments. Manpower is inadequate to support children with VI [Mselem, interview, March 2009].

School infrastructure is important in ensuring access and success in education to all children and even more important to children with VI. Most classroom desks are prepared for sighted children, posing challenges to children with VI. Children with VI require a large space to use in the teaching and learning process. Overcrowded classrooms did not make the situation easier. There was not enough room and the children with VI could be sharing a desk with two or even three peers. As it was difficult to meet the learning needs of children with VI, some of the teachers suggested employing class assistants who could support children with VI in the school environment and during lessons in note-taking, reading what was written on the chalkboard and translating the teachers' notes into Braille. Mercy, a special education teacher, came up with this solution.

> Due to pressure on the loaded curriculum content and large class sizes with few materials, there is a need to employ specialist persons to support children with VI in taking notes, to read from the chalk board and later assist the child in preparing notes in Braille print. [Mercy, reflection meeting, March, 2009]

Some of the proposed solutions, for instance employing experts in Braille who could support the children with VI, were unrealistic as employing extra manpower required external support and funding. Also modifications of the school environment and professional development courses were not easy to implement without funding. After realizing that these kinds of solutions could not be implemented, the teachers started to propose immediate solutions that can be made by teachers. Teachers proposed preparation and use of teaching materials as one of the solution.

During the reflection meeting the teachers determined challenges they faced during the teaching and learning process in a regular class that included children with VI to be related to teaching methods, teaching strategies, use of language during the teaching and learning process, shortages of teaching materials, methods of assessing children's progress, classroom management, shortage of time to support the learning of all children, children's participation in the teaching and learning process, and lesson evaluation. There was a challenge also in teaching some specific topics like statistics, accounting, long division, teaching figures, teaching different body systems like the excretion system and food system, drawing maps and teaching multiplication of numbers with two or more digits. In brainstorming with the teachers, it was agreed that preparing tactile teaching materials would help to solve most of the challenges teachers in implementing classroom teaching practices that would benefit all children, including children with VI (Table 13).

Table 13. Teachers' views on the challenges in teaching children with VI

Challenge	Number of teachers
Shortages of teaching and learning materials	14
Preparing teaching and learning materials for inclusive class	14
Using teaching and learning materials in inclusive class	14
Evaluating children's progress and performance	12
Many topics are difficult to teach, e.g. accounting and biology	10
Classroom management	10
Use of language during teaching and learning process	9
Children's participation in the teaching and learning process	9
Teaching methods and strategies	8
Time allocated to teach inclusive classroom not enough	7

Source: Reflection meeting March, 2014

From Table 13 it can be seen that the challenge that was mentioned by all teachers was about the availability, preparation, and use of teaching and learning materials. In the following sections in this thesis I report on how teachers tried to solve these challenges. In the next section I describe challenges in the teaching and learning process resulting from teachers' practices as described by the children with VI. Children with VI were included in the study because they presented challenges to teachers, especially in terms of how to support and facilitate their learning.

7.1.4 Children's voices

During the first action research cycle I interviewed the children with VI (n=6) in order to get their opinions on the teachers' teaching methods and strategies twice. Children with VI involved in the study included Zipo, Zabu, Sambi, Ngosi, Poki and Safi. Poki and Zipo both had total blindness and were in class six. All the children with VI who participated in the project were boys (See Table 3). In class IV Ngosi and Safi had low vision. In collecting the data I performed individual interviews and three group interviews. The advantages of group interviews are that children discuss and therefore provide explanation that is accepted by the whole group. Before the interviews, the head of school introduced me to the children during the first day. During the interviews the teachers were not present. This enabled the children to talk freely on what usually happens during the teaching and learning process. In this section I present the voices of these children. My assumption was that the teachers' challenges were reflected in the children's experiences and thus it was important for me as a researcher to listen to the children's voices about their learning situation.

The challenges the children mentioned were related to learning in the classroom, answering questions, posing questions, the inability to use teaching aids, shortages of in-class readers, shortages of equipment, assessment, classroom management, and shortages of books. The children with VI pointed out that they learn through touch and through listening. They answer questions when the teacher mentions their names. However, the children with VI seldom ask questions as result of inability to read the mood of the teacher. Children with VI were afraid the teacher could get angry with them when they showed interest by asking questions and raising their hands. The children also told that they seldom participate in group discussions. Their experience was also that the teachers do not explain much and that teachers do not use tactile teaching materials. Zipo, a class VI blind child, was of the opinion that it was difficult to participate in the classroom activities because of teachers' teaching practices and behaviour:

> We learn through listening, and answering questions when asked. I answer questions when the teacher mentions my name. It is difficult to initiate questions because we cannot read the mood of the teacher. The challenge is that some teachers talk fast and I cannot understand, and there are some who also talk with very low sound so that I cannot hear. In group discussion we listen. There are times also when some students make a noise in the class. Sometimes I depend on my sighted peers to read to me what they wrote. [Zipo, interview, March 2009]

The children also said that they had no in-class readers and no Braille printed books. The school also had a shortage of equipment which could facilitate learning, e.g. magnifying glasses for pupils with low vision. The children also pointed out that the school library did not have Braille printed books for the new syllabus (that started being implemented in 2005 in Tanzania) to supplement

what was missing in the classroom. The described situation caused difficulties for the children with VI to follow the lessons.

> In the class I have difficulties in following the lesson. I do not have a class reader. I participate only when a teacher prepares a Braille print text for me. I do not have magnifying glass. I am using Braille print text like the blind. The other challenge is that the library had no Braille print text books related to the new curriculum. I therefore depend on the teacher notes that are read to me through readers after class hours.[Poki, interview, March, 2009]

The children showed interest in certain school subjects, for example history, civics, geography, English and science. Science was taught by a teacher trained in special education. The children with VI indicated little interest in learning for example mathematics because there were no suitable books and no material they could use. Zabu, a pupil in class IV explained the situation.

> History, civics, geography and science teachers explain their lessons very well. But in mathematics I fail to understand. I dislike most mathematics lessons because there are no teaching materials for us. There are no mathematics books for us to use. If there are books also we cannot follow if we do not have enough explanations from the teacher. If there are resources for us and teachers explain well we can learn better. [Zabu, interview, Mach 2009]

When asked about areas in mathematics that caused problems, the pupils mentioned geometry and long division. The children mentioned explicitly that they do not enjoy the lesson if teachers do not use tactile teaching materials because they cannot follow.

> I do not enjoy lessons where teachers do not use teaching resources. Tactile teaching materials support in understanding the lesson. [Poki, interview, March 2009]

Sambi and Safi faced challenges when the teacher was silent in the class. Sambi was of the opinion that teachers were supposed to explain everything in the class. The children were discouraged when the teachers wrote on the chalkboard without saying anything. The children emphasized that if the teachers use tactile teaching materials, they learn better.

> During teaching the teachers uses words like ‘look at the chalkboard’, ‘take this and add to this’, please read the following sentences’, ‘you please answer the questions’, ‘can someone read this sentences’, ‘what is the name given to the figures of this kind’. It is even more challenging when the teacher is writing on the chalkboard without reading what is written. I also feel challenged when asked to write a story or a sentence by looking at a non-tactile picture.[Sambi, interview, March 2009].

> Some teachers just write on the chalkboard for our sighted peers to copy. Sometimes we do not know that the teacher is writing on the board, we have to ask our sighted peers. Sometimes we hear the teacher asking what this is, when we ask our sighted peers they say the teacher is using teaching material to elaborate a concept. If the teacher uses tactile teaching materials we all understand. [Safi, interview, March 2009]

The school had one special room used by children with VI for self-study. When asked how they did assignments as there were no Braille print books, they said

they got support from their fellow children with low vision and sometimes from teachers living near the school who normally visit them during self-study time to support them. The study room was used after school hours as all children with VI stayed at the school.

> Our classmates with low vision and those with albinism support us in reading when the printed text is large enough or they have a magnifying glass [Ngosi, interview, March 2009]

The children also mentioned challenges related to classroom management. Safi, a class 4 child, explained he had been stopped doing an examination because he asked his fellow pupil to read out an examination question in regular print to him. The teacher thought he was cheating.

> It was examination time. I was doing an examination. I was seeking reading support from my fellow sighted child. The teacher thought I was looking for answers from my fellow student, whereas I just asked him to read for me as I do not see. I was not allowed to do that examination. In most cases when teachers see us as having a normal eye structure they assume we are sighted. [Safi, interview March 2009]

The children's challenges seemed to reflect those of the teachers. Teachers did not prepare teaching materials and had no Braille texts during the teaching and learning process. For example, children with VI did not learn very well as the teachers did not use tactile teaching materials. There were subjects that children with VI disliked and similarly teachers indicated they had challenges in teaching them (as indicated in Table 12). Especially English and mathematics were difficult subjects to teach without any material.

7.1.5 Summarizing reflections and a way forward

The first action research cycle was about exploring teachers' practices and challenges in order to find out what the problems were and what needed to be done to change the situation. The teachers developed skills as they were engaged in the action research process, which enabled them to explore and identify their practices and challenges. They were also able to refine their proposed solution strategies which aimed at improving the teaching practices and increasing the children's participation and achievement in the school. It was the dialogues during the reflection meetings that increased awareness among the teachers. Together we created a common arena for learning and reflection. When the teachers started to question practices previously taken for granted, I knew that the teachers had started to learn.

The findings from the research activities in cycle 1 revealed the use of a variety of methods and support strategies in teaching the children in the classes. Almost all the teachers provided some kind of support to the children with VI. However, only very few used vision-related support strategies, such as IEPs, Braille prints or extra exercises and explanations. When looking at the variety of support strategies used I could conclude that there were different strategies, but the teachers were not aware of the strategies their colleagues used. There seemed to

be no sharing of knowledge and skills and no collaboration between the teachers. I could see that there were solutions on the teacher level, but collaboration seemed to be missing. This gave me as researcher an important lesson.

In the reflection meeting at the end of cycle 1 the teachers identified various challenges as described in section 7.1.3. Of the identified challenges, limited supply of teaching and learning materials was the most common challenge. This challenge affected most of the teachers and therefore they decided to focus on this challenge. Another reason for choosing this topic was that the teachers thought they could do something about the lack of teaching material. My conclusion was that the teachers during the meetings had created a common understanding of the challenges and the possible ways to solve the challenges. To develop teaching and learning material suitable for children with VI was thus decided to be the goal for the next action research cycle. In section 7.2 I describe the process of how the teachers addressed the challenge of lack and limited supply of teaching materials. The teachers started to prepare and to use tactile teaching materials and thus developed new knowledge of their teaching practices for children with visual impairment.

7.2 Cycle 2: Developing tactile teaching materials

As stated above, cycle 1 ended with a meeting held on April 3rd. The meeting aimed at reflection on the activities and outcomes of cycle one and planning of activities in cycle two. During the discussions in the reflection meeting the teachers decided that teaching materials would be the main focus of cycle 2, because it seemed that the lack of suitable teaching materials for children with VI was the biggest challenge. It was also a challenge that the teachers were able to solve. In this sub-chapter I present the results on how teachers in cycle 2 started solving their teaching challenges, specifically concerning shortages of teaching materials appropriate for all children and specifically for children with VI. Cycle two was implemented from 3rd April to 14th May, 2009.

The aim of the activities in this cycle was to facilitate and engage teachers in the preparation and use of tactile teaching materials. The assumption was that tactile materials could benefit children with VI, because they could use their sense of touch. The idea was that teachers could change their practices through the process of preparing and using teaching materials suitable for all children. The teachers were also asked to explore the challenges they faced during preparation and use of teaching materials. The analysis of the activities and the outcomes of cycle two indicated that teachers started developing skills in preparing and using tactile teaching materials. An overview of activities of the teachers and the researcher in action research cycle two is presented in Table 14.

My role as a researcher in this cycle was to develop skills in how to facilitate teachers in planning how to prepare and use tactile teaching materials. However, it was the teachers who came up with the ideas about what to do. By doing so we collaborated in identifying barriers and challenges in the process of preparing

and trying out tactile teaching materials in the school. I collected information through interviews, classroom observations and through discussions in the meetings.

In the first part of the second action research cycle I spent five days (3-8.4) arranging two meetings and collecting data through classroom observations and interviews as described in Table 14. I conducted two meetings because this cycle was practice-oriented and the teachers needed time to reflect and to put their ideas into practice. The first meeting was about discussing and planning of the activities and it was agreed that the teachers would start preparing some material. In the second meeting two days later the teachers presented their initial reflections and findings on practices and challenges in preparing and using tactile teaching materials. In the meeting the teachers agreed that it was necessary to continue to prepare and to try out tactile teaching materials and explore challenges they faced as they tried out the tactile materials.

Table 14. Overview of activities in cycle two

Activity	Dates	Teachers	Researcher
Interview with head of school and reviewing documents*	3– 8.4		×
Planning meeting with teachers	3.4	×	×
Teachers preparing and using tactile teaching materials (TTM)*	3 -8.4	×	
Interview with children with VI *	4 -8.4		×
Observing teaching and interviewing teachers*	5 – 8.4	×	×
Meeting with teachers	8.4	×	×
Teachers preparing and using TTM and exploring challenges	9 .4 -14.5	×	
Interview with children with VI	13.5		×
Reflection meeting	14.5	×	×

*These were continuous activities during the period when I was in the school

In the second part of the cycle (9.4-14.5) the teachers were left on their own for a period of about one month with instructions to continue to prepare and to try out the tactile teaching materials they had prepared and to explore challenges they faced while preparing and trying out the tactile teaching materials and write about them in their provided notebooks. After this period I visited the school again for two days when I interviewed the children with VI (13.5) and conducted a reflection and discussion meeting (14.5). This meeting marked the end of cycle two. Based on the findings obtained through discussions during the reflection meeting, the aim of this meeting was also to plan activities for the third action research cycle. The activities and findings of cycle 2 are as presented in the next

sections (7.2.1.-7.2.3.). The findings are based on observations, interviews and discussions in the meetings.

7.2.1 Creating, preparing and trying out tactile teaching materials – the start

Shortly after the planning meeting in the beginning of cycle 2 (3.4.), the teachers started preparing tactile teaching materials (TTM) aimed at being suitable for all children, including those with visual impairment. The teachers were used to preparing teaching materials for sighted children whom they usually taught and were trained to teach. The situation was new and different for most of the teachers when they found themselves teaching in classes including children with VI. The challenge was how to facilitate the learning of both the visually impaired and sighted children without being prepared and qualified for the task.

In order to obtain a picture of the problems related to the teaching and learning in the classes and to the preparation and use of teaching materials, I started with interviewing the teachers and observing their teaching. I also interviewed the children. The teacher interviews were conducted when the teachers waited for their lessons to begin or after they had completed the teaching tasks of the day. The interview periods varied between 10 and 30 minutes. I managed to interview the teachers before and after observing their lessons. I also interviewed children before the teachers had started using the teaching materials and after the teachers had used the newly prepared materials in order to determine whether there were any changes. After five days a meeting was held (8.4.) where the teachers presented preliminary results, reflections, and ideas for further development and practice during the following five weeks.

What did the teachers do when they started to prepare the tactile teaching materials? Their knowledge was at first limited, but they were eager to try. Many did not know how to make well-labelled tactile teaching material that would facilitate the learning of child with VI. However, in creating tactile teaching materials they used their existing knowledge and skills in creating materials for sighted children and started by making those materials tactile. This idea was new to most of the teachers. They used the available school books which were meant for sighted children. The books had drawings and pictures for facilitating learning of sighted children. The teachers used the pictures and drawings in the books and made them tactile. Sometimes the teachers also improvised tactile as well as visual teaching materials to be used in the teaching process.

In the meeting (8.4.) teachers presented how they had tried to address their challenges. Those identified in cycle 1 were still the same (cf. Table 5.), but some of the teachers had tried to do something in order to solve them. Three teachers had prepared some kind of tactile teaching materials and two reported to have used the material and equipment available in order to prepare the material. In the table below (Table 15) a summary of the challenges, together

with the teachers' comments, are presented. The data are based on statements from the meeting.

From Table 15 it can be seen that some of the teachers had not yet got an understanding about what kind of concrete measures were possible. Some still focused on the problems and what they could not do, while some tried to address the problems by doing something differently. Those teachers who started preparing tactile teaching materials decided to use locally available materials such as glue, hard papers from used boxes, sand and threads. The teachers showed interest in the project as it had practical implications for their work and contributed to solving some of the practical problems they faced in their teaching. All the teachers prepared and tried out teaching materials in their teaching and learning process. They felt that preparation of tactile teaching materials would facilitate the learning of all children included in their class, not only the children with VI.

Table 15. Teachers' challenges and comments (frequencies)

Challenge	Teachers	Comments
Teaching materials	14	Prepared tactile materials
Equipment	14	Used available the equipment and tools
Lesson presentation	13	Teaching materials had no Braille text
Choice of teaching strategy	2	Challenged on managing the class
Teaching reading	1	It was problem to children with VI
Shortages of experts in Braille	2	Inability to prepare Braille materials
Lesson evaluation	1	Children with VI participated in lesson evaluation
Teaching writing skills	1	Remained a problem to children with VI

The tactile teaching materials prepared were interesting to both sighted and children with VI (Photo 1 & Photo 2). This caused classroom management problems as all the children wanted to use the teaching materials. According to Mselem, the head teacher, teaching materials support teachers in choosing teaching strategies, which are limited to lecturing in a situation where there are no books and no materials.

> If there are no teaching materials the choice of teaching strategies becomes minimal, similarly it is difficult to provide exercises for the children when you know that they do not have books to use. We (teachers) become overburdened as they have to write a lot on the chalkboard. Teachers are asking for materials to use. It is likely the school will increase performance as teachers are motivated to teach. [Mselem, reflection meeting, April 2009]

Despite the challenges described above the teachers in this action research cycle started to prepare, try out and use tactile teaching materials in their teaching process (Photo 1 & Photo 2). The teachers' actions are presented in table 16. They prepared tactile teaching materials for different subjects, for example mathematical figures like a circle, triangle and prism (Photo 2). The science teachers prepared drawings of types of soils, a human heart, a human ear and a human kidney for grade six children (Photo 6). A geography teacher prepared

maps and material for teaching topographical maps (Photo 5). The history and civics teachers prepared drawings of organizational charts, while the Kiswahili and English teachers prepared Braille print passages for visually impaired children to read in the classroom.

The teachers were eager to prepare materials and came up with innovative solutions. Some teachers also started to collaborate with each other. However, the preparation and use was not always an easy process. In the next section I describe the teachers' views on preparing, trying out and using the tactile teaching materials. The findings presented are based on teacher interviews and statements from the discussions in the meetings.

Table 16. Teachers' preparations and actions by teaching subject

Name	Teaching Subject	Material prepared and actions taken
Agnita	English	Collaborated with Amos to prepare Braille text
Amos *	Civics	Prepared organizational chart with Mercy
Antonia	English	Prepared tactile picture with less Braille print
Baraka *	Kiswahili	Prepared Braille text
Benjamin	HaibanaMichezo (Personality and Sports)	Used Baraka to prepare Braille text
Betty	Stadi za Kazi (Vocational skills)	Participated in creating TTM by using the locally materials for other subjects
Boni	Mathematics	Prepared tactile circle, triangle with no Braille print
Clara	Kiswahili	Collaborated with Baraka for Braille text
Edina	Geography	Prepared tactile map
Esta	History	Braille text, tactile teaching materials
Herena	English	Braille English reading text
Mercy **	Civics	Organizational Chart
Mselem**	Science	Molded science teaching materials using sand and old clothes
Msigalila	Mathematics	Prepared tactile figures without Braille illustration

Source: Field data at Maisha Primary School (April 2009)

7.2.2 The teachers' views of the tactile teaching materials

In this section I describe the teachers' views of what happened as they started to use tactile teaching materials (TTM) in their teaching. According to the teachers the use of TTM developed their teaching practices, created collaboration among the teachers and increased the visually impaired pupils' participation in the classroom activities and improved their motivation to learn.

The teachers were *developing their teaching practices* through preparation and use of tactile teaching materials. They changed their teaching strategies and methods for supporting children with VI. Esta, a history teacher, gave an example of her developed teaching practices and exemplified how the TTM had helped her to teach the children with VI in her history class.

> I was curious to do something after discussion. I asked my fellow teacher with knowledge in special education. Then I just found a hard paper and drew the village

> organizational chart using pencil and later started putting holes using a sharp nail in the drawing. I provided the tactile teaching materials for the children to use during my teaching. They were very happy. I just did that. In the past it was difficult to engage visually impaired children in my teaching. For example, if I drew an organization chart, I ask who calls a general meeting. The sighted children would answer easily using the chart. But the visually impaired children would not, as there are no books to use during the lesson. With tactile teaching materials that has been possible. It has supported me in explaining concepts to children with VI during teaching. Tactile teaching materials have aided in explaining the village organizational chart to every student in my classroom. [Esta, interview, April 2009]

Also another teacher, Boni (a mathematics teacher) gave an example.

> I am now using both oral and the tactile teaching materials to involve the child with visual impairment when measuring learning progress in and out of the class. .. I sometimes provide assignments based on the tactile teaching materials I managed to prepare. [Boni, interview, April 20009]

One aspect of developed practices was also increased *collaboration* between the teachers. The teachers participated in small group discussions about how to prepare and use the tactile teaching materials and supported each other. When the teachers needed Braille prints they consulted the special education teachers or the teachers with visual impairment. The mathematics teachers, Boni and Msigalila, commented on the collaboration between teachers.

> When faced with a problem about teaching materials I normally consult the teachers trained in special education to guide me on selection and use of teaching materials. They are trained they know the impact of using such materials and the psychology of the children with VI. [Boni, interview, April 2009)

> We are happy as there is more support among members of the community. There is support among teachers and children. If you face a problem in Braille print texts you just ask the teacher with visual impairment and they will support. [Msigalila, reflection meeting, May 2009]

Increased collaboration among teachers seemed to give them new ideas about how to teach. The teachers also discussed with the children about the classroom activities and the support strategies used. They obtained new insights into the situation of children with VI. Benjamin, the personality and sports teacher, and Boni, the mathematics teacher, gave the following examples.

> I have improved my teaching …after class lessons I now plan to have time to interview children with VI to tell me what happened in the class. …this has not happened before. [Why now?] I have some strategies to support their learning. You know now we are working as a team. [Benjamin, reflection meeting, April 2009].

> Sometimes I discussed with children about my lesson. Those with blindness were positive to what I did. When I asked the child with low vision [Sambi] in my class, Sambi just told me that he did not see anything. I said to Sambi, but I used a teaching resource today. [Boni, interview, April 2009]

Some teachers also used the sighted peers to support the children with VI. They could help with the use of tactile teaching materials in the classroom and read to children with VI.

> Before using the tactile teaching material in the class I discuss with a teacher with visual impairment, the comments received I incorporate and later on use in the class. As my class size is large, I normally choose one sighted peer to support the children with VI in reading the materials I write on the chalk board or when using a tactile teaching resource. When teaching material is required for use I direct the sighted peer to provide it. [Edina, meeting, April 2009]

When using tactile teaching materials the teachers noted changes in children with VI in the lessons. They were also of the opinion that the children were now *more motivated to learn*. Boni, a teacher in mathematics, gave the following statement.

> The participation of children in class activities has increased. The children are motivated toward learning, and during teaching and learning they are attentive and expect to receive a teaching resource to use. [Boni, reflection meeting, May 2009]

Another teacher, Betty (vocational skills), mentioned that tactile teaching materials have reduced her tension and that teaching now is more fun and the children are more motivated and learn better. Also Clara, a Kiswahili teacher, talked about the improved participation of a pupil with VI in her class.

> Use of tactile teaching materials has reduced my tension. If I expect to provide an exercise for the class, I go with questions for the children with VI. When teaching a new concept I plan for teaching materials to be related to the concept to all children. The good things with the resources we use are that they are coming from their daily environment and thus easy to follow. For example, when I teach a concept pot I bring the actual pot used in our environment. Therefore, teaching is now more fun and child-centred. The children are highly motivated in learning as I am in teaching them [Betty, meeting, April 2009]

> There is improvement: now Safi [a child with visual impairment] is participating well in the class. If it is a reading class she is given Braille text to read for others in the class. If I ask questions referring to teaching material I used, she participates in answering questions like other sighted children. The project has enabled me to teach and assess my teaching process more easily. [Clara, meeting, April 2009]

The head of school was positive in supporting teachers while they participated in the action research project as he assumed that it was possible to develop capacity among staff in supporting children with VI enrolled in the school. According to the teachers, the head of school was positive as he allowed the teachers to create an environment in which teachers collaborated and supported each other in developing skills to support children with VI. The support from the head of school was important in the beginning when the teachers started learning about how to prepare and use tactile teaching materials. According to Agnita (English teacher), he encouraged the teachers to learn to make teaching resources. Agnita commented also on the efforts to make the school environment more accessible.

> Our head of school is positive toward supporting teachers in improving teaching. He has also has made efforts to ensure that there are clear paths around the school and that stairs are reduced if not removed completely. If you have a problem with tactile teaching materials he would ensure that you work together with him and prepare it. He does not want to prepare while alone as he says what will happen if you need a teaching resource and I am away. You have to learn how to improvise by yourself. [Agnita, interview, April 2009]

On the whole, teachers were developing interest in the way they started changing their practices and facilitated the learning of children with VI included in their classrooms through the use of tactile teaching materials. These materials seemed to make both teachers and children enthusiastic towards learning. However, not all problems were solved by preparation and use of the teacher-made tactile teaching materials. There were still many challenges. In the next section I present the challenges the teachers encountered.

7.2.3 Challenges related to preparation and use of tactile teaching materials

During the preparation and use of tactile teaching materials teachers analysed their practices and identified challenges related to the preparation and use of tactile teaching materials. Through the discussions in the meetings, classroom observations and interviews with teachers it was possible to identify several challenges: challenges related to time, space (infrastructures), children's needs, planning and organizing teaching in the class, financial resources and knowledge and skills in teaching a regular class including children with VI. In the next paragraphs I describe these challenges. The findings are based on data from interviews with teachers, classroom observations, and group discussions in the meetings.

Table 17. Challenges related to preparation and use of TTM

Type of Challenge	Number of teachers
Time	8
Space/ school infrastructure	10
Determining children's needs	9
Planning and organizing teaching	6
Knowledge and skills in preparing and using teaching materials	8
Financial resources	7

Time was identified as a critical factor, a frame factor affecting the whole teaching activity and the preparation as well as the use of tactile teaching materials. The teachers experienced that the strict fixed timetable was a problem. The use of tactile teaching materials required additional time for planning and designing, for finding the necessary materials, for instructing the children with VI to use the material in the class and sometimes for seeking guidance and consultation from teachers trained in special education or from visually impaired teachers. Teachers consulted the teachers with VI when there was a need for a

Braille illustration or translation in the teaching materials. Benjamin, the personality and sports teacher mentioned time as a challenge.

> The problem I face I discuss with my fellow teachers and we come up with some new strategy. My challenge is on how to manage time as I need to mobilize resources, and seek guidance and support from my fellow teachers. Time to me and my fellow teachers is a challenge; we would use time after school hours, but we have a program to support struggling readers that we started last year. Regardless of time being a challenge, as an academic master, I will try my best to collaborate with others so that this project contributes to improving the learning of visually impaired children in this school. [Benjamin, interview April, 2009]

The time to implement the curriculum is set by the curriculum developers and teachers are expected to abide by it. The school time-table is fixed. The teachers had no possibility to change the time allocated. There are a fixed number of days to cover the syllabus. Considering the central nature of assessment in Tanzania, time is to be followed in order to cover the syllabus. Teachers have no additional time to plan together and for providing individual attention during teaching. The tactile teaching materials require more time for planning, for collecting necessary resources, and time to discuss with other teachers about the feasibility of the materials. Teachers were of the opinion that time to implement the curriculum did not allow any flexibility, especially in schools including children with disabilities. Statements from Agnes and Msigalila exemplify this challenge.

> The time given for a period is 40 minutes and the coverage of the syllabus for each class is fixed to one year. The 40 minutes which are allocated in each period are not enough. Similarly, in the syllabus no instructions are given as to how to support children with disabilities enrolled in a class. I can say the syllabus is designed in a way that does not welcome persons with disabilities. [Agnes, reflection meeting, May 2009]

> The timetable is fixed. You cannot change it. Currently after school hours we have periods to teach those who do not know how to read and write. Time is a challenge here, you know the curriculum is prepared by someone and given to another person to test. There are no guidelines as to how to use such time in inclusion. [Msigalila, reflection meeting, April 2009]

Space and school infrastructure were other critical frame factors. Teachers needed space for preparing, using and storing the tactile teaching materials created. In attempting to solve problems resulting from space, teachers had to face the challenge of determining the size of the tactile teaching materials.. The issue of size came in when considering the classroom provisions that include class size, size of desks and number of children seated at each desk. The teachers Edina and Msigalila commented on this.

> I am challenged by the size of the teaching materials appropriate for children with VI. Sometimes you prepare and later you notice it is too big for the child to handle during the teaching process. The class size is big and there is not enough space for each student. [Edina, reflection meeting, May 2009]

> The use of tactile teaching materials needs children to move around the class, and not all teaching materials will be smaller to fit the smaller children's desk…children

> occupy a small desk space. We cannot make any further rearrangement to suit the needs of all learners. [Msigalila, reflection meeting, May 2009]

The challenge related to the availability of space to prepare and store the tactile teaching resources was related to the school infrastructure. The classrooms were too small in relation to the large number of pupils. This made it difficult for the teachers to prepare, store and use the tactile teaching materials developed.

> While the classrooms were designed for 40 students, they are in practice used for more than 70 students. In this case there is not enough space for free movement for interaction. Children with VI face more problems as there is no special sitting arrangement for them. The good thing is that if there are few desks their sighted peers leave a space to be occupied by the child with visual impairment. In such a situation is it possible to use teaching materials? Where are you going to put them? But we are trying though it is difficult. [Betty, reflection meeting, May 2009]

> The office spaces are not enough for all teachers to prepare and store tactile teaching materials. Also when one wants to use tactile teaching materials the space in the class is small. There is shortage of equipment for teachers and children to use. [Benjamin, reflection meeting, May 2009]

The process of determining the size of the teaching materials resulted in questions about the available classroom infrastructure if children with disabilities enrolled in the class were to be supported. In this case both teachers and the children faced problems: the children needed teaching resources, the teachers thought using teaching resources facilitated the children's learning, but the lack of space in the classrooms in which the children were placed did not favours the use of such tactile teaching materials. This challenge needed further investigation on how to use of teaching resources in the existing classroom conditions. This was so because teachers had no power to increase the size of classes in the school or to reduce the number of children in their classrooms. Therefore, the infrastructure challenges were barriers to learning as teachers were unable to implement the curriculum as required.

Another main challenge was related to *determining the children's needs*. As teachers started using tactile teaching materials they discovered that there were children who did not benefit from them. The teachers had to identify and understand the individual needs of the children. The teachers lacked enough knowledge and skills in identifying and addressing the needs of children with different learning needs and disabilities included in regular classes. Assessment methods that favour sighted children (and sighted teachers) were a problem for children with VI included in the regular classroom. Edina, a geography teacher, talked about the different learning needs in a class.

> It seems difficult to prepare a teaching aid that caters for the needs of all learners. In the class, though I am not an expert in special education there are children who learn very fast, those who learn slowly, those who learn fast and forget, those with low vision, children with blindness and some who might have mental disabilities. I think each needs a special way of teaching and requires special tactile teaching materials. I propose the curriculum developer should prepare a teacher guide that describes how to help all types of learners. [Edina, reflection meeting, May 2009]

The teachers faced problems in *planning and organizing teaching*. This challenge was more evident when they started using tactile teaching materials. The tactile teaching materials were interesting to both sighted and the visually impaired children. The questions were, e.g. how to provide tasks, measure learning outcomes and provide support in a class including children with VI. Benjamin also mentioned the time factor, which according to him, made it impossible to support a child with VI in the class.

> I provide the teaching material for children with VI before a lesson in order to check for clarity. It challenges me as to what time to provide teaching resources to the child with visual impairment. When providing tactile material for children with VI also sighted children show interest and say that they also need the same. If the student is not in front of the class it becomes difficult to support. Remember, there is no additional time allocated for supporting a child with visual impairment and that I support the child during my teaching. [Benjamin, reflection meeting, May 2009]

> I had a challenge in managing children with VI during the teaching and learning process. In one incidence a child told me that I heard when you were talking to others. I thank you for not asking a question about the teaching resource you were using it because I wouldn't have answered. [Why?] I did not see at all! [Agnita, reflection meeting, May 2009]

Financial resources to most of the teachers seemed to be a challenge as teachers needed money to buy equipment needed when preparing teaching. Although the teachers used such local materials that were available, sometimes the teachers needed to buy something.

> I face financial resources when I need to buy equipment to use in preparing tactile teaching materials. The head of school sometimes supports but the school resources are insufficient. [Agnita, interview May 2009]

Most of the teachers pointed out that they had *no knowledge and skills* in preparing teaching materials used in teaching regular classes enrolling children with VI. In the college they were oriented to teach sighted children and to prepare visual teaching materials. Less emphasis was placed on teaching teachers how to prepare tactile teaching materials. In most cases teachers are used to preparing teaching resources used to teach sighted children. The primary teaching aid was the chalk board, on which teachers, especially mathematics teachers, illustrate concepts for the children to master. Both special and regular teachers faced challenges in teaching a class enrolling sighted and visually impaired children.

> I face challenges in teaching a class including children with VI because at college I was not taught how to teach them. I do not know what strategies and or methods to use. I face more challenges when I need to suggest their requirements, as I do not know their learning needs. [Antonia, reflection meeting, May 2009]

> I am not clear which strategies to use. When I was trained as a regular teacher I got skills and knowledge about teaching sighted children. After three years I was enrolled in Patandi teachers college to learn about supporting individuals with visual impairment. In the special education teacher college, Patandi, I was trained in skills

to support children with VI but not how to support them in an inclusive education setting. [Mercy, reflection meeting May 2009]

The way teachers were reflecting upon the teaching materials they had started to prepare and use indicated that they had started changing their teaching practices. Their knowledge and skills about tactile teaching materials improved. Most of the teachers engaged in preparing and trying out the new materials, but the implementation was not always easy. The teachers identified challenges related to the materials. School infrastructure with overcrowded classrooms was a problem. Lack of time and money were also challenges that were not easy to solve. It was also difficult for the regular teachers to plan and organize the teaching and to determine the actual learning needs of the children with VI. In the next section I describe the children's experiences of the new teaching resources.

7.2.4 Children's voices

During implementation of the second action research cycle I also interviewed the children with VI twice: once in the beginning of the cycle and the other time towards the end. I wanted to understand what happened when the teachers started preparing and using tactile teaching materials with the aim of facilitating the learning of children with VI included in regular classes. The interview guide used focused on children's views of the new methods and strategies the teachers had developed as a result of preparing and using tactile materials.

According to the children, tactile teaching materials are necessary for them in order to participate in the teaching and learning process. The children said their teachers were using tactile teaching materials, which made them enjoy lessons in the class more than before. However, some of the children said the teaching materials were not very clear and in some cases they were too large. Zabu's statement exemplifies this.

Teachers are using tactile teaching materials, but some of the tactile teaching materials are too big to handle in the classroom. There are materials that we do not understand, but if teachers included some Braille text as extended explanation we could understand. ….We learn through touch, therefore tactile teaching materials make us enjoy the lesson and we feel included. [Zabu, interview, May 2009]

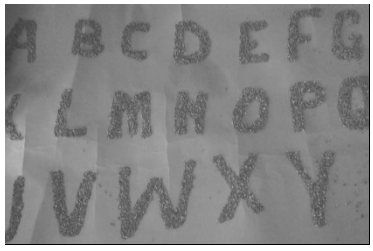

Photo 1. Tactile Alphabets without Braille text

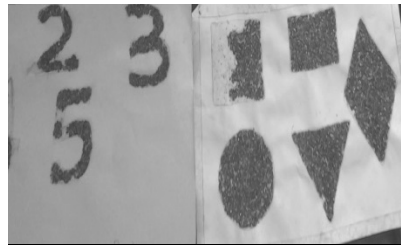

Photo 2. Tactile numbers and figures without Braille text

Most of the teaching materials in the school favoured sighted children. The school had no Braille print textbooks. Children with VI were entirely dependent on learning through the classroom teaching and learning process. Use of tactile materials was one way to support the children in increasing their understanding. However, most of the teaching materials did not have enough Braille text illustrations (Photo 1 & Photo 2). Safi, a child with low vision in class 4, was interested in the project as it supported him in learning. He said using tactile teaching material helped a lot as at school he was unable to read illustrations written in the chalk board. At Maisha Primary School both blind and those with low vision use Braille print text.

> However, there is shortage of Braille print text books. In the past most of the teachers did not use any teaching materials. I enjoy lessons when I touch tactile teaching materials; I understand what is discussed. I have friends in the class who support me when teachers are teaching. This becomes easier for them, too. [Safi, interview May 2009]

The use of teaching materials supported children with VI in the situation when there were not enough Braille print texts. The child's comments indicate that there were changes that were positive in terms of facilitating their learning. However, the child could not always use the materials prepared for him.

> In the class I feel there are some changes. When the teachers use tactile materials, I feel included. But the challenge is that once the tactile materials are given to me, the sighted children take them. This discourages me. [Poki, interview May 2009]

According to Poki, the tactile teaching materials were wanted not only by children with VI but also by the sighted ones. In the teaching and learning process the use tactile teaching materials increased interest in learning among all children. It seems that what is good for visually impaired children is good for all. Children with VI started to feel included in the teaching and learning process. According to the children's views, tactile teaching materials were necessary for them to interact fully with the content presented. Where teachers used teaching materials, children with VI were able to join in and benefit from the lessons. However, children had the view that the teaching materials used needed improvement as some did not had Braille print text as labels.

7.2.5 Summarizing reflections and a way forward

In cycle two the teachers started preparing and using tactile teaching materials (e-g photo 1 & Photo 2). The teachers started using their creativity and the knowledge and skills they had started to acquire. The initial findings were promising. Both teachers and children had positive views of the preparation and use of tactile teaching materials. The teachers were able to develop their practices and take the children with VI into account more than before. According to the teachers, the children with VI learned better and they participated more in the lessons. The teachers also started collaborating with each other. However, there were still many challenges. Some teachers experienced challenges of time,

space and infrastructure when using tactile teaching materials in the classrooms. It was noted that some of teaching resources were too large to fit in the class due to class space and it was not always easy to know how to use them so that they could benefit the learning of the children with VI. The learning needs of the children were different; one type of material did not suit all the children with VI. Although there were still many challenges, I could notice that the process gave the teachers opportunities to reflect, to act and to learn. A good example of this was that the teachers understood that they have to involve the children (with VI) in order to know what was working and what was not. Previously, they had not taken the children into account.

After discussions about the successes and challenges in the preparation and use of tactile teaching materials during the reflection meeting at the end of cycle two, the teachers had to decide on the agenda to be carried into the third cycle. The teachers were pleased that there was a noticeable change in the availability and use of teaching materials in the school as a result of the project. They further seemed to agree that there were positive changes in the learning of the children with visual impairment. Hence, the teachers were encouraged to continue improving their practices so that children with visual impairment could participate and learn even better. During the meetings I could see an increased sharing of experiences, some elements of collaboration, mutual respect and shared ownership. The teachers and I had created an atmosphere of collaborative learning and reflection. Despite the positive outcomes there were still challenges related to the preparation, supply and usability of the tactile teaching materials. As a result of this the teachers decided to further develop and refine the tactile teaching materials in the next action research cycle.

7.3 Cycle 3: Developing tactile teaching materials: emerging innovations

In cycle two the teachers started to prepare, try out and use tactile teaching materials. A meeting aimed at reflection on the activities and outcomes in cycle two and planning of cycle three was held on 14th May 2009. The teachers reported that the tactile teaching materials they had developed were not optimal or effectively used as a tool for changing the teaching practices and improving the learning of children with VI. Some of the materials were of large size and some had inadequate Braille text. There were also challenges in terms of how to use the developed teaching materials in the teaching and learning process in an overcrowded classroom in which children with VI were included. Because of the identified challenges the teachers decided to continue to further develop tactile teaching materials. In this sub-chapter I present the results on how teachers developed the materials further and what kinds of innovations they made. Cycle three was implemented from 14th May to 17th August, 2009.

The aim of the researcher's activities in cycle three was to study how teachers further developed tactile teaching materials as a basis for improving their

practices in classes enrolling children with VI. The idea was that the teachers would improve their practices when they developed and used more teaching materials of better quality accessible to children with VI. The analysis of the activities and the outcomes in cycle three indicated that the teachers had developed more knowledge and skills in preparing and using teaching materials in their teaching. The analysis also revealed some innovations that were not used before in the school. An overview of teachers' and researcher's activities in cycle three was as indicated in Table 18.

In this cycle I aimed developing an understanding about how teachers were further developing their teaching materials and teaching practices. To reach this aim I interviewed the head of school, the teachers, and the children with VI and conducted three meetings with all the participating teachers. I also observed classroom teaching in order to assess how teachers implemented solutions related to earlier identified challenges related to tactile teaching materials in their classrooms.

We (myself and the teachers) agreed that I should observe teaching and conduct interview sessions with the teachers and the children with VI during my stay from 14th – 22nd May 2009. The interviews with children were conducted before and after the lessons in order to find out the children's expectations and outcomes concerning the use of tactile teaching materials. I was interested to know what changes the teachers had made. Apart from the interviews and observations I conducted meetings with teachers to create a communicative space for sharing and exchanging ideas. Between May 14th and 21st the teachers could try out their ideas. On May 21st I conducted a meeting where the teachers presented their reflections on the process and we agreed that they should continue improving the materials and their teaching practices. In the meeting we also agreed that the teachers should interview the children with VI about the new material and use of the materials in the classrooms.

Table 18. Overview of activities in cycle three

Activity	Dates	Teachers	Researcher
Interview with head of school and reviewing documents*	14.5 – 22.5		×
Planning meeting with teachers	14.5	×	×
Teachers preparing and improving TTM	14-21.5	×	
Interview with children with VI *	14-21.5		×
Observing teaching and interviewing teachers	14-21.5	×	×
Meeting with teachers	21.5	×	×
Teachers further preparing and improving TTM	22.5-17.8	×	
Teachers interview children with VI*	22.5-17.8	×	
Reflection meeting	17.8	×	×

*Interviews and document reviews were a continuous process during my stay at the school.

In the second part of the action research cycle (23.5– 17.8) the teachers were left with instructions to continue to observe, reflect and further improve their teaching materials and their teaching practices as they used the improvised materials. They also continued exploring their practices and challenges for the purpose of further improving the teaching materials and their teaching practices. This time the teachers had a long period of almost three months to act and reflect. During this time the teachers also had a possibility to assess whether the materials they had developed had improved the academic performance of children with VI. The examinations in the end of May made this possible. Teachers and children at Maisha Primary School had no school sessions from the end of May to early July because the school was closed for school holidays.

After this period I visited the school again for a reflection and discussion meeting on 17.8.2009. This meeting marked the end of cycle three. Based on the findings and the reflection, the focus of the meeting was also to agree about the activities to be done in the next action research cycle. On the whole, the teachers reported improvements in both teaching practices and the teaching materials they had prepared and used, and they were of the opinion that the improvements had facilitated the learning of all children included in their classes, not only the children with VI. The teachers also reported that the academic performance of children with VI had improved. In the following subchapters (7.3.1-7.3.3) I present the activities and outcomes of cycle three. The presented activities and outcomes are based on interviews, observations and discussions in the meetings.

7.3.1 Further development of tactile teaching materials

During cycle two the participating teachers identified challenges related to the preparation and use of tactile teaching materials. They identified challenges related to time, space (infrastructures), children's needs, planning and organizing teaching in the class, financial resources and knowledge and skills in teaching mainstream classes including children with VI. In cycle three the teachers tried to address the identified challenges. To solve the problems related to *time*, some of the teachers came up with the idea that the *sighted children* could support the teachers in developing the teaching materials. The teachers asked the sighted children to collect concrete materials and sometimes the children were involved in making the materials. The prepared teaching materials were used by all children during teaching and learning process. In this case, the time to prepare the teaching materials was reduced. During the teaching and learning process, the teachers also used sighted peers to support the children with VI. Whilst the sighted children used their sight, the children with VI touched the materials, read the Braille text, and listened to explanations from the teachers and their sighted peers. Msigalila (mathematics teacher) gave an example of this support strategy.

> Time has been a challenge. But now I use the sighted peers in preparing and using the teaching materials. The tactile teaching materials prepared benefit all children. Sighted children prepare the materials and use them, and the children with VI use their touch skills in both labels and figures. Labelling is done using Braille print and ordinary print. This is what I have learnt in this project. I enjoy it when one teaching material is used by all children in the class. I see that teaching materials are now more inclusive. In this way time is minimized both in preparing and using the tactile materials. Sometimes the lesson is extended as sighted children would continue explaining to their fellow children with VI after the lesson. [Msigalila, interview, May 2009]

As was noted in 7.2.3 the classes were overcrowded and thus the *space* available was small for the children with VI. It was difficult for them to use the tactile materials appropriately. The teachers modified the prepared teaching materials to fit into the available space. They had to think about quantity and quality of the materials and came up with ideas on how to make the materials accessible to children with VI in large classes. The desks did not have enough space as they were meant for sighted children. Three to four children were seated at a single desk which was meant for two children. One of the teachers, Esta, a history teacher, acknowledged that the project had made her conscious of the use of teaching materials in relation to the teaching and learning materials. She solved the problem of space by making the materials smaller.

> I have improved the teaching materials. Initially, the teaching materials were too large in such a way that most did not fit into the small space available in the classroom, and there was not enough Braille print text. Now they are better and children with VI are following the lessons and are able to answer questions just like their visual counterparts. For example, they can mention a place on a map or try to label the parts of a figure. [Esta, interview, May, 2009]

In addressing the challenge of *determining needs* of the children with VI, the teachers in this cycle decided to interview children with VI before and after the lesson presentation. By interviewing children with VI it was possible to know how they did and what needed to be changed. After the lessons the teachers developed a culture of interviewing the children with VI to reflect on what happened in the classroom, the part of the lesson that was interesting to them, the use of teaching materials, and suggestions for future improvement. The children's evaluations were used to plan lessons, prepare teaching materials, and organize the class according to the children's needs. Teachers and children were all confident in their teaching and learning as the use of tactile teaching materials increased at school. Esta and Agnita gave an example of this strategy.

> Children's reflections on lessons made me understand what they need. Sometimes, I ask them to suggest what should be done so that their voices are involved in my lesson. I learnt that preparing Braille text for some parts of the lesson and increasing Braille print text in labelling teaching materials improved participation in the classroom activities. [Esta, reflection meeting, August 2009]

> When preparing teaching materials I consider the learner needs. In my class I have blind children, those with low vision and the sighted. For all to benefit I consider size, colour contrast, weight, and the desk space used by the VI-child. [Agnita, interview, May 2009]

The increased availability of teaching materials reduced *planning and organizational challenges*. The sighted children developed positive attitudes to preparing tactile teaching materials. Sighted children used pupils' books to design and prepare tactile teaching materials. In this way the teachers were more positive toward supporting children with VI in their learning process. This created a situation where both children with VI and sighted children had materials to use during the teaching process.

> Both sighted and children with VI have materials to use. The same material is used because it is tactile with normal and Braille print text so both can read and understand what is written. As materials are increased organizational challenges in using teaching material has been reduced. Even preparation of teaching materials now is no longer a problem; the bright pupils take drawings from their text books and make them tactile. [Antonia, interview, May 2009]

Teacher interviews, discussions in the meetings, and classroom observation revealed that teachers as well as children had developed *knowledge and skills* in developing and using teaching materials. The materials in this cycle were smaller, of better quality, increased in number, and had Braille illustrations with colour contrast. One of the teachers, Esta, a history teacher, acknowledged the project had made her conscious about the quality and quantity of the tactile teaching materials.

> In my class students are happy as I am now using tactile teaching material. The challenge I face is shortage of resources for preparing teaching materials. Sometimes in my class when I use tactile teaching material I face a challenge of space in the desk and of preparing Braille print. I do not know how to read Braille text. I am

> trying my best to make children with VI participate in my lesson presentation. [Esta, interview August, 2009]

In the use of resources teachers developed more teaching resources using locally available materials. The teachers and sighted children used manila sheets, sand, glue, sticks, dry leaves and threads. These materials are available within the school locality.

> I am using locally available teaching materials. I enjoy using them during teaching and learning sessions as all children use the teaching materials. When explaining a concept using teaching material all children benefit and therefore tactile teaching materials make teaching more effective. I believe that the available teaching materials within the school environment, if effectively used, will improve the teaching and learning process as both sighted and children with VI will benefit. [Benjamin, interview May 2009]

The teachers in this cycle were developing skills in preparing teaching materials so that they were all inclusive. The teachers started developing an interest in developing and using adapted teaching materials. Through the increased interest teachers were able to solve challenges related to time, space, planning/organization, resources and increased knowledge and skills in preparing and using teaching materials. In the next section I show how the use of tactile teaching materials helped teachers in improving their teaching practices by creating accessible teaching and learning environment.

7.3.2 Teachers improving their teaching practices

The teachers became inquisitive in developing and implementing their teaching using the improved teaching materials. They started using more varied teaching methods and strategies in their teaching. They seemed more aware of the use of different teaching methods and started to work more in a learner centered way. The teachers, for example, encouraged the children to participate in the class activities using different teaching strategies. Some of the strategies included group discussions, demonstrations and whole group teaching methods. There were three main types of teaching strategies, namely whole group teaching (lecture), individual or small group teaching(small group instruction) and pupils learning together through cooperating (cooperative learning). Also elements of peer-teaching had been introduced. In teaching the whole class, the teachers normally used the lecture and demonstration method, but could also group the children into smaller groups, for instance when there was a topic that the children needed to practice. In the following statement Clara, a Kiswahili teacher, explains the different teaching methods she had started to use.

> In the class I interact with students in different forms. I teach as a whole class and sometimes I teach and focus on a particular student and also on a group of students so that they help each other. Whole group teaching I use in order to demonstrate a skill or knowledge t the hat children will work on. If I want them to use prepared learning material for learning, I describe it and later give it to them to do and I supervise. At the end if I have grouped the children then each group presents what

> they have been doing. Sometimes different groups are given a different task to do. This helps to make each group listen to what others are presenting. In this type of activity there are elements of peer teaching. One child instructs the other child. [Clara, interview, May 2009]

Also the teacher teaching Stadi za Kazi*,* Benjamin (vocational skills), had started to use teaching methods that were suitable for all children in the class. Benjamin was encouraged to include children with VI as part of improving his teaching activities.

> A class including children with VI seems to be good as there are many challenges to both teachers and children in the use of teaching materials. I like to teach a class including children with VI because it encourages me to prepare and use teaching materials to improve my questioning techniques and provision of activities in the class. I normally prepare teaching materials that would encourage all children to participate in hands-on activities like the use and preparation of different facilities including blooms?, manila chairs, some teaching materials and also materials that would encourage children with VI to participate in other classroom activities, including answering questions. [Benjamin, interview, May 2009]

There were teachers who realized the need to increase the amount of teaching materials to support the learning of children. The teachers acknowledged that children with VI had developed abilities to ask questions and teachers had increased their abilities in teaching them. The mathematics teachers cited examples of teaching children with VI in mathematics using games. The teachers had the opinion that improved and effective communication in the classroom might help the pupils, both sighted children and children with VI to be more active in the learning process. The mathematics teacher Boni gave the following example.

> The class now is active and all students are active. Currently, there is a need to have more resources and we consider there is a need for increased time in each period. With the improved communication teachers can now instruct children with VI in mathematics through games. Children with VI participate in asking and answering questions posed in the classroom. [Boni, interview, May 2009]

The improved teaching materials had a positive impact in developing the teachers' practices towards more inclusive practices. They changed their teaching styles from teacher centred to child-centred ones. They also learned to take the children with VI into account more than they had done before. Mercy, one of the special education teachers, explained the change towards inclusive practices in the school.

> In my view children with VI are not different from their sighted peers in terms of academic performance and sometimes they perform better. For them to participate in classroom activities, the use of tactile teaching materials is important. The presence of children with VI in regular classes does create a better relationship with the sighted peers as they want to read for them. The classroom activities I provide for children include individual exercises, group work, and oral questions for the children to answer. One of the impacts of participating in this project is that I have been able to change teaching method from being teacher-centred to learner-centred. Now in the

> school concrete materials and other tactile models have been prepared in large quantity. [Mercy, interview, May 2009]

Use of improved teaching materials increased the teachers' skills and knowledge about how to facilitate learning among their pupils. The teachers' statements in the reflection meetings and in the discussions that were held both with teachers and children revealed that the teachers had improved their practices as a result of using further developed teaching materials. The teachers' improved teaching strategies were seen as an indicator of change. The improved strategies encouraged children with VI to participate in class activities, improved class arrangements, introduction of peer tutoring and cooperation between sighted children and children with VI, increased children's confidence and support of teachers in improving assessment techniques in the teaching and learning process. Also collaboration between teachers started to emerge. It was evident that some innovations were implemented. In the next section I present the teacher innovations and outcomes of further development of teaching materials and improving teaching practices. These findings are based on data from interviews and discussions in the reflection meetings.

7.3.3 Teachers' innovations

As a result of the improved teaching materials and the more versatile use of teaching methods and strategies there are some qualitative changes in the teachers' practices to be noticed. As these changed practices were new and had not been practiced earlier in the school, I have called them innovations. The innovations are summarized in Table 19.

Table 19. Teachers' innovations

Theme	Innovations
Collaborations	Collaboration among teachers with VI and sighted teachers in preparing and trying out the tactile materials, lesson presentation
Preparation and use of TTM	Teachers with VI prepared and used tactile teaching materials in collaboration with the sighted teachers
Teaching strategies	Co-teaching, peer tutoring, use of tactile teaching materials
Adapted materials	Written notes and texts in Braille, tactile teaching materials.
Assessment strategies	Preparing tactile diagrams to be used in preparing tests requiring naming parts in a figure.
Classroom organization	Prepared fixed seating arrangement in the classroom

The emerging innovations could be categorized into five different themes: collaboration, preparation of tactile teaching materials, teaching strategies, adapted teaching materials for pupils with VI and assessment in teaching. Below I describe the teachers' innovations. The findings presented are based on classroom observation, teacher interviews, interview with head of school, teachers' meeting, and the end of cycle reflection meeting.

The teachers started to *collaborate* with each other. The collaboration took several different forms. The sighted teachers supported teachers with VI in preparing and trying out teaching materials. The sighted teachers prepared the teaching materials and the teachers with VI supported the sighted teachers in writing and reading Braille print texts. The teachers with VI were also consulted by the other teachers to suggest improvements to the teaching materials and they prepared Braille prints to be attached to the teaching materials. Such collegial use of teacher experience had not existed in the school before. It was an innovation in the sense that new ideas and experiences were emerging while implementing the project. Amos, a civics teacher with VI, gave the following example.

> If I want to prepare a teaching resource and use it I ask a sighted teacher to prepare it for me. During my teaching the sighted teacher assists me in its use. Every teacher prepared and used tactile teaching materials in the class. Teachers with visual impairment were supported by their sighted peers and the sighted teachers were assisted by teachers with visual impairment in preparing Braille illustrative texts. [Amos (Teacher with VI), interview, May 2009]

The teachers realized that preparing tactile teaching materials was not enough for improving the learning conditions. Hence, the teachers needed to learn how to use the material in an optimal way. One way to properly use the teaching materials was to *organize the classroom*. This was also something new, an innovation. Some teachers started to make use of the skills they had developed during the action research cycle and suggested permanent classroom seating arrangements among children with VI. The seating arrangement supported children with low vision to participate in the lessons.

> I increased knowledge and skills in increasing the availability of Braille print text, tactile teaching materials, planning of class arrangements, using child-centred teaching methods, preparing and using teaching materials, and allowing children with low vision to sit in front of the classroom as a way to support their learning.[Esta, meeting, May 2009].

> As a result of the shortages of furniture and text books I decided to use adapted materials. In order to ensure good use of materials I planned a fixed seating arrangement. The seating arrangement ensures that children with VI are in front of the classroom and have desks and chairs. Another feature of the seating arrangement was that children who perform well sit with children with VI to reduce errors in spelling. [Clara, reflection meeting, August, 2009]

The school had no books in Braille print which followed the new curriculum. The situation was the same in all schools; none of the publishers had printed Braille print books. This caused big challenges for the teachers with VI and also for the children with VI who were facing challenges in accessing information from the school books. The teachers with VI needed current materials in order to prepare lessons and the children with VI needed text books to support their learning. Some teachers came up with the idea of preparing notes from different books that were available in the school. The teachers decided to use adapted materials. The sighted teachers developed notes from different books and asked

the teachers with VI to write them in Braille. This was also an innovation in the school. Agnita (English teacher) explained the situation.

> I find it difficult to get exact books to use. During our period we had a standard book. In these days each publisher publishes a book in different ways. This presents challenges to teachers in advising parents about which book to buy. For visually impaired children it is even more serious as there are no Braille books printed, and the school does not have enough funds to print reading materials for them. I am teaching English, and it is difficult to instruct the visually impaired children. Currently, I am asking the visually impaired teachers to print some passages for them to read. It helps! [Agnita, Interview March 2009]

The teachers also improved their *assessment strategies*. They increased their ability in assessing children's achievements through both assignments and class activities. The teachers revealed that with use of tactile teaching materials (Photo 4 & Photo 5) the performance of children with VI improved.

> I assess children's achievement through individual work and group activities. Children with VI are also given exercises to do both in class and as homework. If children with VI require special material I prepare it in advance and provide it for them. Of course, with use of tactile materials the academic performance of children with VI has improved. They also participate well in group assignments. Now it seems children have much interest in learning and they like to do many things together with their sighted peers. [Agnita, interview, May 2009]

In the next section I describe the voices of the children with VI. The focus is on understanding how they perceived change and whether the changes that occurred influenced their teaching and learning process positively or negatively.

7.3.4 Children's voices

Also during cycle 3 I interviewed children with VI because I wanted to obtain the children's opinions about the tactile teaching materials and how the teachers used them. I was interested in investigating the outcomes of the use of tactile teaching materials on the learning of the children with VI. I asked the children with VI two questions. The first was about changes they had noticed during teaching and learning process and the second was about suggestions for further improvement. I wanted to find out whether the children with VI were benefitting from the developed teaching practices. Sambi, a visually impaired child in class 4, was of the opinion that the resources were now manageable in the classes. They were now easier to use than previously and they were of better quality. To Zipo, a student in class VI, good quality meant that the materials were self-explanatory and that the pupils with VI could use them independently. Said explained that the teaching materials had Braille print texts.

> The teaching materials have been improved. They are smaller and can easily be handled. They have Braille print that makes them easy for us to use. The illustrations are clearly marked. [Zipo, interview, May 2009]

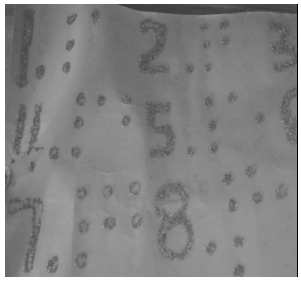

Photo 3. Tactile Numbers with Braille illustration

Photo 4. Tactile figures with Braille illustration

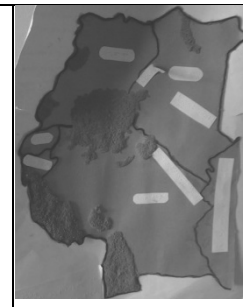

Photo 5. Map with Braille illustration

Poki, a visually impaired pupil in class six, was of the opinion that the quality of the teaching materials, classroom practices, managing teaching materials and the support systems had improved. However, he was unsure of the sustainability of the improvements.

> I thank the coming of the project. Teachers have prepared a number of teaching materials and improvised strategies of acquiring learning materials from ordinary print for us. Already teaching materials are being used. The classroom practices have changed to a more positive direction. The teachers' ability to manage classes including children with VI has increased. My worry is whether this will be sustainable. [Poki, interview, May 2009]

Both Poki and Zipo indicated that there were positive changes in the teachers' skills in facilitating learning. The increase in availability of teaching and learning materials developed a positive attitude to learning among all children. When teachers are facilitated to support children with VI they improve their teaching practices and thus the learning of children with VI is improved. Sambi, a visually impaired child in class 4, gave a description of the positive changes.

> In the past we were learning through listening, and answering questions when asked. Now teachers are involving us in teaching through the use of TTM. I can now answer a map reading question or a question that involves drawing in mathematics like a circle or a triangle. Teachers have changed the way they teach us. Previously teachers were talking very fast, but now a little bit they are changing maybe because we have time to talk to them. [Sambi, interview, May 2009]

During implementation of the project the children with VI noticed changes that were important for their learning. These changes were a result of the teachers' developed practices and the fact that the teachers were taking the children with VI into account more than they had done before. They had started to involve the children with VI in their classroom teaching.

7.3.5 Summarizing reflections and a way forward

When the teachers in cycle three developed the tactile teaching materials further and started to reflect upon their proper use, it seemed that the teachers had

learned to solve at least some of the challenges. The teachers' practices also seemed to have changed as a result of learning and reflection. The teachers were now able to use a number of teaching techniques in a more varied way than before and they were more active in preparing teaching materials. They also started to support each other and to work as a team. These changes are examples of the innovations that emerged during cycle three. As a researcher I could clearly see that the innovations were evidence of a learning process.

In the reflection meeting at the end of the cycle the teachers reported that they were encouraged with their further development of the teaching materials and the way they had started to improve their practices. They agreed to engage in further improvement of their practices and activities, but this time with a new focus on collaboration. The idea of collaboration was brought forward as a result of mutual support and sharing of knowledge and experience that was created among sighted teachers and the two teachers with VI in cycle 3. Also the teachers' ideas to involve the children contributed to collaboration. My assumption as researcher was that the teachers started to see the benefits of collaboration and to understand that new ideas and practices are created in collaborative actions. Collaboration was agreed to be the focus of the development process in cycle 4. In the next section I present findings on how teachers improved their practices and outcomes through collaboration.

7.4 Cycle 4: Changing practices through collaboration

In cycle three the teachers developed the teaching materials further and analysed the way they improved their practices. Further development of the teaching materials also led to new practices and innovations. A meeting aimed at reflection of the outcomes of cycle three and planning activities for cycle four was held on 17.8.2009. The teachers reported that some of them had formed some kind of partnership and collaboration in facilitating children with VI. The collaboration practices were new and the teachers expressed a concern to further investigate the way they could develop and change their practices and outcomes through collaboration. Hence, collaboration became the focus in cycle 4. In this subchapter I present the results on how teachers improved practices and outcomes through collaboration. Cycle four was implemented from 17th August to 4th September 2009.

The aim of the activities in this cycle was to facilitate teachers to analyse and improve practices and outcomes through collaboration. The analysis of the activities and the outcomes of cycle four indicate that the teachers started improving their practices and outcomes through collaboration. An overview of the activities of the teachers and the researcher in cycle four is presented in Table 20.

My aim as a researcher was to understand how the teachers changed their practices and outcomes through collaboration. In attaining that aim I conducted three meetings, collected information about teacher practices and collaboration

by interviewing teachers, observing classroom teaching and interviewing children with VI.

During the first part of cycle four, I spent five days in the school (17-22.8). In this period I arranged two meetings and collected data by interviews and classroom observations as described in Table 20. My intention was to make teachers active in changing their practices and creating awareness for improving practices and outcomes through collaboration. In the first meeting the teachers and I planned all the activities to be done in cycle four. After the planning meeting the teachers continued with their daily activities while implementing the agreed activities for a few days and I continued observing classes and interviewed both teachers and children with VI. In the second meeting (20.8) the teachers presented their findings. The collaboration went well and the teachers decided to continue to analyse and improve their practices in their specific teaching subjects.

Table 20. Overview of Activities in Cycle Four

Dates (2009)	Activity	Teachers	Researcher
17.8	Planning meeting with teachers	×	×
18.8	Interviewing teachers	×	
18-22.8	Interviewing children with VI	×	×
18.8-22.8	Observing teaching while teachers collaborated	×	×
20.8	Meeting with teachers	×	×
17-22.8	Interviewing teachers	×	×
22.8 -4.9	Teachers' exploring practices and collaborating	×	
4.9.	Reflection meeting	×	×

In the second part of the cycle (22.8 – 4.9) the teachers were left on their own with instructions to observe, reflect and explore as they improved their practices and outcomes through collaboration. After this period I visited the school again for a reflection meeting on 4.9. This meeting marked the end of cycle four. In this meeting I provided teachers with discussion questions. The discussion questions were the topics that were used for interview. In this reflection period the same interview guide was used so that I could get group answers and a general consensus on the belief about changing teacher practices through collaboration. During the reflection meeting the teachers were divided into groups and had to write a report and present to their group. This was one of the ways to collect written accounts from the teachers on how they improved their practices and outcomes through collaboration. Based on the findings and the reflections, the focus of this meeting was also on planning activities for the next following cycle and in that respect this meeting was also an introduction to cycle five.

The overall results indicated an increase in collaboration aiming at improving teacher practices and outcomes. In cycle four the teachers were also collaborating with children in preparing teaching and learning materials. My concern became to facilitate teachers in identifying the outcomes of this collaboration and its contribution to the improvement of their practices in the school. For the context of this study collaboration is taken to mean the process and act of jointly making things happen. It is when two or more partners work together in solving a problem or initiating change. Collaboration therefore is the partners' initiative to change the status quo. Collaborations are a symbol of willingness to work together towards a common goal. In this study the teachers realized that they could no longer afford to work in isolation. Both parties in this study had a common goal, improving the teaching practices and learning outcomes through collaboration.

Several forms of collaboration were created. One form was collaboration between teachers (regular teachers and special education teachers; sighted teachers and teachers with VI). Another form was the collaboration between children and teachers. The third form of collaboration identified was between the children (sighted children and children with VI). In the next sections (7.4.1-7.4.3) I describe the three types of collaboration. In the description I focus on collaboration practices and outcomes of collaboration. The data presented are based on interviews, observations and the reflections expressed during the meetings.

In the next section I present the findings on how teachers improved their practices and outcomes through collaboration based on the interviews with teachers and children, the classroom observations, and the discussion meetings with teachers. All the fourteen teachers were interviewed individually by the researcher and attended all the discussion meetings. In addition, all the six children with VI were interviewed.

7.4.1 Collaboration between teachers

The collaboration and outcomes of the joint activities between the teachers were investigated using data from the interviews and the reflection meetings. All the teachers viewed collaboration to have changed their way of teaching. The collaboration resulted in teachers introducing new teaching strategies such as co-teaching, team teaching and the use of sighted children to support children with VI.

The teachers collaborated through common planning. They planned and prepared learning materials together, shared experiences and knowledge, tried out co-teaching and team teaching and they acted and reflected together. The main outcomes of the collaboration were related to increased knowledge and skills, time, motivation and change of practices. One of the main outcomes of the collaboration was *increased knowledge and skills* among the teachers. They worked together to prepare teaching materials, discussed and chose teaching

strategies and methods and reflected together about what support strategies to use in order to support the learning of children with VI. The developed skills supported the teachers in teaching classes including children with VI and meeting the learning needs of all children. The teachers' collaboration supported them as they developed skills in encouraging children with VI to participate in class activities, encouraging sighted peers to support them during teaching, and providing them with teaching materials that enabled the children with VI follow the lesson. Examples of the teaching materials are shown in the photos below (Photo 6-8). Agnita (English teacher) gave an example of the preparation of the materials in the interview.

> In participating in this project I feel competent in supporting children with VI. When I face a problem, I just ask other teachers to support me. Each teacher feels an equal partner as there is a lot of interaction, the school practices we developed have supported in increasing the availability of teaching resources that facilitate the learning of children with VI. At school we are flexible enough; each teacher supports each other as we have a shared responsibility. When a teacher with VI wants to use teaching materials, the sighted teacher supports him in the class, in co-teaching. This has made teachers to work as team members. The visually impaired teachers collaborate with sighted teachers in preparing teaching materials, especially those requiring Braille print. [Agnita, interview, August 2009]

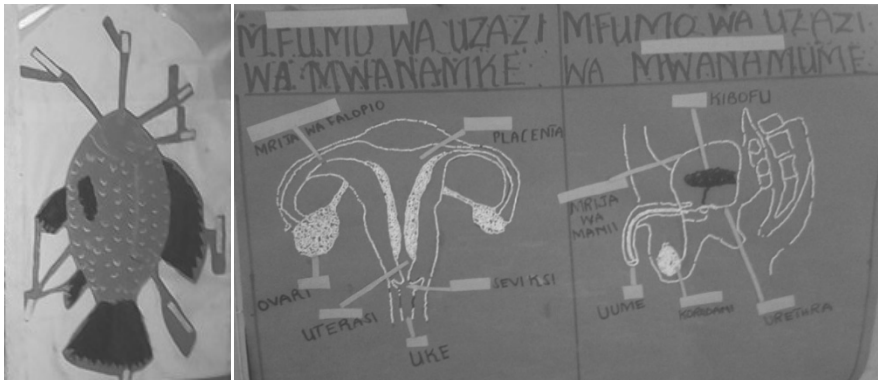

Photo 6. Sample of tactile teaching materials developed

Teachers collaborated in the preparation of tactile teaching materials and were involved in creating, planning, and facilitating the learning of children with VI in using the teaching materials. Both the regular and the special education teachers were involved in constant learning on how best to facilitate children's learning through a variety of teaching materials. Most of the teachers had the view that the availability of learning materials improved their teaching practices and created opportunities for all children to access the given curriculum in the classroom.

> Through the collaboration created among teachers with and without VI I have developed knowledge and skills to teach classes including children with VI. The skills include the use of tactile teaching materials, peer to peer support, encouraging class interactions like making children with VI respond and ask questions. When there are interactions, learning is enhanced. Children are free to comment on my

> teaching and I ask them about how the teaching went on. In this respect children feel included in the classroom. [Benjamin Reflection Meeting September 2009]
>
> In further development of teaching materials with the assistance of sighted teachers I increased the supply of Braille print text in my teaching, made tactile teaching materials with Braille print labelling, made permanent classroom seating arrangements and used teaching methods and strategies that include all the children during the teaching and learning process. The teaching was inclusive because the tactile teaching materials had both visual and tactile labelling that made sighted children and those with VI to support each other. When I needed to use the teaching material the sighted teachers supported me. [Amos [Teacher with VI], Interview, August 2009]

During the interviews with the teachers it was revealed that sighted teachers supported teachers with VI in preparing and using teaching materials. The teachers with VI described the nature of the topic they were to teach. The sighted teachers prepared the material and labelled them using ordinary print. In similar cases the teacher with VI labelled the teaching materials using Braille print. It was a step toward raising the academic performance of all the children in the school. The teachers viewed that the use of teaching materials motivated children to learn and enjoyed participation in the classroom activities.

> I feel happy. Why? The sighted teachers are more cooperative. They prepare teaching materials and give them to us to assist them in making comments on the usefulness of the teaching materials. And when we need to use teaching material for the class with sighted children the sighted teachers support us in preparing and using the resource in the class. This exercise is likely to raise the academic performance of all children in our school. Children are motivated to learn and teachers are motivated to increase the availability of improved teaching materials. The sighted teachers also prepare a tactile model for the children with VI and I just print illustrative text using Braille and again the teacher fixes it at an appropriate space. During teaching and learning all the children have resources to use. This is very good. [Baraka (Teacher with VI), Meeting May 2009]

The other outcome of collaboration was related to *time*. When teachers collaborated, the preparation of the tactile teaching materials was less time-consuming. The teachers could also divide the work between themselves. For example, a sighted teacher could prepare the materials and a teacher with VI could prepare the Braille text. The learning materials prepared were validated by teachers with visual impairment for the children with VI to use. Through the collaboration process the sighted teachers developed creativity in teaching diverse classes. Edina, a geography teacher, gave an example of the positive outcomes of collaboration.

> The time for preparing teaching and using teaching materials is reduced, as both sighted teachers and the teacher with VI work together. In participating in the project I got knowledge and skills in preparing inclusive teaching materials. In preparing the teaching material I had to think more and this made me remember things. Where I faced difficulties I collaborated with other teachers in thinking together. Above all, the project has made me like the subject I am teaching more in a class including children with VI. [Edina, interview August 2009]

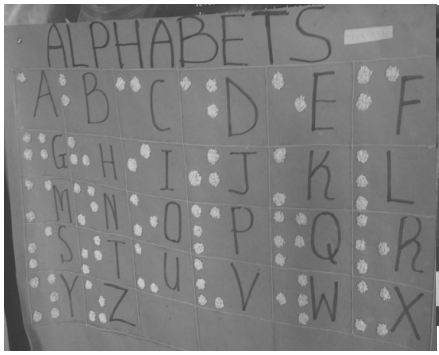

Photo 7. Alphabets with illustrations in Braille

Photo 8. Sample of textbooks used in primary schools

The teachers' collaboration was improvised in such a way that when other teachers were teaching the teachers who had no periods collaborated through discussions and planning for the next lesson. For teachers with VI the support was through sighted teachers entering their class to display teaching resources prepared as they appeared in children's textbooks.

In this way the teacher with VI explained everything about the teaching resource and the sighted teacher had to point to the parts as the teacher with VI explained. To support the teachers with VI the sighted teachers interchanged their teaching time. It should be noted that the fixed time-table did not mean all teachers had periods all the time.

> Collaboration made me use the time when I do not have a lesson to start talking about how to improve my teaching. I have now been able to enjoy my lesson. I am teaching Kiswahili; previously it was difficult for me to teach spelling to children with VI. But through collaboration with the teachers with VI it has been possible for me to enter the class with adapted teaching materials: some sample text written in Braille print. I now enjoy teaching classes which include children with VI. [Clara, Interview, August 2009]

The weekly distribution of periods for different subjects indicated that teachers had sometime within the week for planning and collaborating with other teachers in improving their practices. The outcomes of collaboration among the teachers included increased knowledge and skills in facilitating teaching in classes including children with VI, time for sharing and preparing teaching resources, increased teacher motivation towards teaching, increased supply of tactile teaching materials, improved assessment criteria, and changing teaching practices. These themes and the way teachers developed them are summarized in Table 21.

Table 21. Practices and outcomes through collaboration between teachers

Outcome of collaboration	How they collaborated
Increased knowledge and skills	• Discussed how best to teach and choose and implement teaching strategies and methods together • Reflected together and learnt skills to identify challenges through children's perspectives
Co-teaching	• When a teacher needed to use tactile teaching material asked a colleague for help • A teacher with VI explained and a sighted teacher supported teacher with VI to display the TTM during a lesson
Implementation of curriculum to all children	• Discussed how to prepare and use teaching materials suitable for all children
Increased supply of tactile teaching materials	• Worked together to increase the supply of tactile teaching materials • Teachers discussed how to prepare TTM during lessons in Stadi za Kazi • Teachers with VI validated the TTM the teachers had prepared • Teachers with VI prepared illustrative texts in Braille
Increased teacher motivation	• Teachers were eager to use teaching materials in their classes • Teachers analyzed problems they encountered and together initiated new strategies • Sighted teachers and teachers with VI shared experiences during discussions
Time was no longer a constraint	• Used lessons in Stadi za Kazi to prepare tactile teaching materials • Reflected together on how to prepare and use TTM when they had no period to teach • Head teacher created time for teachers to share experiences in the school
Change of teachers' practices	• Discussed about new teaching practices • Shared experiences together during meetings • Discussed new ways for lesson presentation and evaluation • Discussed how to increase the performance of the pupils
Improved governance	• Discussed how to improve decision making in the school

Source: Field data (September 2009)

Co-teaching was an innovation because it was implemented in a school with shortages of teachers and teaching and learning resources. The implementation of co-teaching was made between teachers with VI and sighted teachers. This was possible because, as indicated in Table 21, not all teachers had periods to teach the whole week. During co-teaching the sighted teacher supported the teacher with VI in using teaching materials. Important to note was that the whole lesson was facilitated by the teacher with VI and the role of the sighted teacher was to use the pointer to indicate what was being explained in the teaching

material for sighted persons. It was an interesting experience for both the teachers and the children.

In co-teaching all the teachers had a shared vision and a common goal, which was improving the learning of all children included in the class. In so doing, they had different roles to play: the regular teachers prepared teaching materials, and teachers with VI prepared the Braille text of the materials and finally the sighted teachers supported the teachers with VI in using tactile teaching resources in the classroom.

In this cycle elements of *governance* started to be noticed. Governance involves, among other things, making decisions. Teachers started making decisions on what to teach and how to teach without much hesitation. This was so because almost all topics to be covered had a number of tactile teaching materials that teachers could use.

> Now I am happy when I decide on a lesson to teach and implement it without worries. When I feel the teaching materials are not enough I decide to collaborate with my fellow teachers to prepare more, and sometimes I ask the teacher with VI to validate my teaching resources before use. I can say I make informed decisions as a result of the collaboration developed at our school. [Clara, interview August 2009]

There were teachers who said they had started noticing *development* in the school. When asked what they meant about development, most referred to the ability to meet learner needs. To them development is about meeting needs and/or demands. The teachers said that though the path is complex there are emerging developments. These were emerging because they talked about development resulting from the actions teachers were performing and had no pre-knowledge as to what would happen. The teacher who initially prepared tactile teaching material without Braille print, Msigalila, said:

> When the project started I was not aware what would happen in the near future. I remember when I prepared my tactile teaching material without Braille print a visually impaired child told me that he did not learn anything. It was my first time to learn that Braille print is a communication media for the blind and that Braille print is entirely different from regular print. Now I see we have developed because everyone is fond of preparing tactile teaching material. Sighted children also are involved in preparing tactile teaching material. [Msigalila, reflection meeting September, 2009]

Apart from Msigalila, Boni, a mathematics teacher, said they were learning. The teachers stated they were transformed from regular teachers to teachers who are able to facilitate learning in inclusive classrooms, classes including children with VI. The teachers also were transformed from being simply teachers who teach, to teachers who also conduct research to identify problems and challenges for the purpose of improving their teaching practices. It is through learning that teachers changed from being self-centred to being able to share knowledge and develop co-teaching strategies.

> Learning is taking place in our school. Now every teacher is improving the learning of all children. Teachers are more concerned with facilitation of learning of children with VI enrolled in their classes. Previously, teachers used strategies that follow a

> one-size-fits-all formula and now teachers are more concerned with the individual child. This type of learning through action, planning and reflecting seems to have helped me in improving my teaching in classes which include children with VI. [Boni, interview August 2009]

The explanations above indicate that teachers improved their practices through collaboration. These collaborations were strengthened by sharing knowledge and skills through the created discussion forums including interviews and meetings. Teachers had discussions on how to develop their teaching and tried different strategies to develop their teaching, including preparation and use of tactile teaching materials, co-teaching, increasing knowledge and skills through practical actions, solving time constraints, increasing the availability of teaching resources and changing practices. In the case where a sighted teacher untrained in special education needed Braille print he or she consulted a teacher with visual impairment. Similarly, where a teacher with visual impairment needed teaching materials like a map or a drawing to use in the class for both sighted and children with VI, a sighted regular teacher assisted in both preparation and in the classroom. Thus, there was co-teaching in the form of team teaching started being practiced in the school. It was this core teaching that enabled both sighted and teachers with VI to use tactile teaching materials in the teaching and learning process.

7.4.2 Collaboration between teachers and children

The collaboration created between the teachers and the children enabled the teachers to prepare learning resources such as mathematical models, different kinds of maps, contour lines, tactile drawings, mathematical models, reading passages, and concrete materials. The materials were used in the teaching and learning process. During cycle four the teachers started to collaborate more systematically with the children. The collaboration formed between teachers and the children facilitated change of teachers' practices and also provided means of supporting children in developing vocational skills. The lessons in the subject *Stadi za Kazi* (vocational skills) were used for preparing the teaching materials. Teachers introduced and supervised the exercise of preparation. The prepared teaching materials were validated for use by the teachers trained in special education and the teachers with VI. Some of the teachers also used the children with VI in testing the teaching materials and in writing Braille print illustrations needed. During the collaboration both teachers and children were analysing the practices of preparing the teaching materials and also the outcomes of the collaboration. In order to understand the process of collaboration I collected data through interviews, observations and the discussions in the meetings. The different forms of teacher children collaboration are shown in Table 22. The findings are based on data from the teachers' questionnaire, interviews and classroom observations.

In implementing this action research cycle it was revealed that collaboration contributed in creating inclusive practices in the school. Through collaboration

the teachers and children increased their knowledge and skills in facilitating learning, managed time, increased motivation, increased ability to remember the taught content, shared knowledge and experiences, improved communication, increased the availability and quality of teaching materials in the school, and supported partners in developing critical thinking on issues about how to develop inclusion practices in the school.

Table 22. Practices and outcomes through collaboration between teachers and children

Outcome of collaboration	*How they collaborated*
Increased knowledge and skills	• Preparing teaching resources together • Discussing how to prepare and use the material • Teachers taught children skills to prepare and use TTM
Better use of time	• The material was prepared during lessons
Motivation	• Preparing tactile teaching materials together • The teachers encouraged children with VI to learn
Communication skills	• Teachers communicated with children with VI during preparation of TTM • Teachers encouraged the children with VI to ask and answer questions during lessons
Changed practices	• The teachers and the children planned and prepared teaching materials together • The teachers encouraged creativity and innovation • The teachers listened to the children's opinions

While implementing the project the teachers at Maisha Primary School became more dynamic and developed different types of interactions and roles. Through the exchange of ideas and experiences each individual teacher was learning and hence broadening their knowledge base about including children with VI in their classrooms. The teachers learnt from each other, but also from the children. They started to understand how to implement the curriculum to suit all learners.

As stated above the preparation of the tactile materials was done during the Stadi za Kazi-lessons. Stadi za Kazi is a subject that is designed to teach children some components of vocational skills. Other subject teachers in collaboration with the Stadi za Kazi teacher examined the syllabus and determined the skills to be taught. Those skills were meant to be used in preparing teaching materials in different subjects. These skills included moulding, cutting materials to sizes, measuring, drawing, colouring, and gluing. These skills were taught to the children and later used to prepare teaching materials as practical training. This reduced the *amount of time spend in preparing teaching materials*. Betty, vocational skills teacher had the belief that engaging children in preparing teaching materials enhanced their vocational skills.

> It is good to support children with VI. I seek help from other teachers and sighted children with skills in moulding and drawing pictures. In primary school the children learn some vocational skills through the subject Stadi za Kazi. Using children and teachers skills reduces the time spent in preparing learning materials. There is also a possibility of creating a positive transfer of experiences from theory to practices. .. I have a number of periods in a week. Therefore, sometimes I have to plan and prepare learning materials in advance. [Betty, interview August 2009]

Teachers developed *communication skills* with children with VI as a result of collaboration. The skills to communicate were developed through the interviews they held when assessing the usefulness of teaching materials, and when the teachers systematically evaluated their lessons by asking the children's views. Such collaboration also supported the children with VI to build communication skills and improved the children's abilities to act independently. These skills were used in the classroom to ask questions and develop confidence to ask teachers when they did not understand something. In this the distance between the teacher and the children was reduced. In the school each staff was responsible for including all children in their teaching. It is likely that the increased communication skills made the children with VI more confident when they were able to communicate with the teachers about the problems with the prepared teaching materials. The children could even suggest modifications. Also the teachers noted positive improvements in their communication with the children. Mselem, the head teacher, reported this in the reflection meeting

> The children are more independent and confident. They can ask questions without the support from the sighted peers. Initially, it was seldom to see a child with visual impairment raising their hand during the teaching and learning process as a sign to want to answer a question. But now it is common. Similarly, as a teacher I have myself changed the communication of appointing a child to answer using the words, "you", "next" and the like. Now if one raises their hand to answer I call them by name. This has made my language in the class more inclusive and has increased the participation of children with VI in their learning."[Mselem, reflection meeting September 2009]

As an achievement through developed communication skills among teachers and children the teachers reported having developed their ability in planning, developing and implementing solutions to the classroom challenges. Communication skills also supported teachers in developing the ability to identify needs, in forming and maintaining collaborations, preparing and modifying teaching and learning materials, and hence developing creativity in dealing with challenges they faced when facilitating learning in classes including children with VI. Clara, a Kiswahili teacher, talked about the positive effects of collaboration with children in an interview:

> In collaborating with children I developed skills in motivating children to learn and to be fond of my subject, skills in reducing the learning barriers to children with VI, and also I have developed knowledge and skills in building creativity to children with VI through planning, developing teaching materials, using teaching materials and monitoring and evaluating the learning progress of children in my class.[Clara, Interview, August 2009]

As a result of the collaboration between teachers and children with VI the subject *Stadi za Kazi* became a useful subject for children with VI. Children with VI had previously identified *Stadi za Kazi* as a difficult subject, but now it turned into being a subject that could help them develop economically. The head of school, Msigalila, who also was trained as a special education teacher, taught the subject *Stadi za Kazi* to children with VI. They were taught skills like making chairs using manila, moulding carpets, moulding different objects, and sometimes they were trained how to cook. The skills were meant to develop independence in their future life. According to Msigalila, the sighted and the visually impaired children participated during *Stadi za Kazi* lessons in preparing teaching materials. In general, he noted increased positive attitudes among children and teachers as a result of collaboration. This also seemed to have a positive impact on learning outcomes.

> The collaboration created between teachers and children has increased the use of learning materials. The children now are more innovative. Sometimes after you have taught a concept you find children have drawn or moulded something representing the concept. Children with VI also participate in hands on activities under the supervision of the special education trained teachers. [Msigalila, interview, August 2009]

The systematic use of tactile teaching material also seemed to have a positive impact on the academic performance of children with VI.

> The children are very happy when teachers use tactile learning materials and note that they are valued and thus had built confidence in learning. Also the performance in examinations is quite different from previous examinations. With the use of learning materials the performance rose to about 85% -95% as compared to the previous performance of about 50% - 70%. [Edina, reflection meeting, August 2009]

Some of the teachers said that with use of teaching materials created through the collaboration the children liked the teachers and the subject.

> I have learnt to improvise different types of teaching materials using knowledge and skills obtained as a result of collaborations experienced in the implementation of this project. I have managed to prepare my own teaching materials. I have also learnt that the use of learning materials made all children like the subject and they liked the teachers who taught the subject using different kinds of good learning materials. [Clara, meeting August, 2009]

Teachers' use of children in supporting the making of learning resources contributed to getting locally available materials that were used to prepare learning resources. The locally available materials, apart from being less costly compared to buying materials, also had the potential to make the children easily relate the teaching resources and the concept taught. The tasks of moulding different objects enabled the children to develop the skills of making other objects that were used as TTM and could later use the same skills to make objects even for selling. These activities learnt in school could support them in their future lives, in their households or in other economic projects and activities. In my view, the collaboration between teachers and children created positive transfer effects from school to community and from the community to

school. Children in the school took raw materials, for instance pieces of wood, boxes, clay soil, and some used objects like bottles and tins from the community and used them to prepare tactile teaching materials. The learning resources created supported their learning at school, but also had potential for sustainable development in the sense that the children with VI could make use of the skills learnt in school.

A third aspect of collaboration was the collaboration between children. In the next section I present the practices and outcomes of the collaboration between children.

7.4.3 Collaboration between children

During the implementation of the project activities in cycle four the teachers encouraged the children to collaborate. The teachers used group discussion methods and peer to peer teaching methods to strengthen the peer relationships in the classroom. For teachers such practices were a way of creating awareness and making the children accept the existence of diversity of learning needs in the class. In the next section I present collaboration practices and outcomes of the collaboration between children. These outcomes were obtained through analysing data from the interviews with teachers and children with VI. Data from the discussions in meetings was also used. In implementing the project teachers interviewed children in order to change their practices and improve the learning of children with VI. As a researcher I conducted interviews with children with VI.

The children with VI had the view that collaboration among children resulted in increased use of tactile teaching materials, motivating both sighted and children with VI in learning different subjects. In an interview most of the children with VI commented that TTM assisted them to learn. Also some of the teachers were of the opinion that collaboration among children in the use of TTM supported children with VI in remembering things. In an interview one of the teachers expressed her views about the collaboration between children.

> Collaboration among children increased the participation of children with VI in school activities, including doing school assignments. They have increased motivation towards learning, and increased ability to ask and answer questions confidently. Both the sighted children and children with VI were constantly becoming creative and curious in how to support each other in their learning. [Agnita, Interview, August 2009].

There were views among the teachers that children with VI when supported can learn better. One way to support them was to enhance collaboration among children. Based on the view children with VI can learn and teachers find possibilities to strengthen collaboration among children in order to support their learning. When I interviewed children with VI about their learning conditions in the school and how they participated in their classes, they said they enjoyed it when they collaborated with their fellow children during lessons. They were able

to remember what the teacher taught and they were motivated to learn. One of the boys with VI gave an example of this.

> I enjoy the lessons in the class, especially when I collaborate with my fellow sighted children. The teaching resources available in the class work better in a mixed group I can ask and answer questions, I like to be in the class and I am motivated to learn more. In Stadi za Kazi I learn skills like knitting, moulding, making chairs using manila sheets, which might help me in my after school life. Sometimes I am involved in preparing learning resources. [Musa, Reflection meeting, August 2009]

During this cycle teachers and I were engaged in preparing, modifying and using learning resources through collaboration among children. The teachers were encouraged to reflect and record changes appearing in classroom during their teaching and learning process. The teachers reported their findings in the reflection meeting.

The children's collaboration was enhanced by teachers. Teachers assigned different activities to children as their ways of facilitating learning. In this project children collaborated during teaching and learning through group discussions, doing assignments and during the use of tactile teaching materials in the teaching and learning process. The children also collaborated with their sighted peers in planning and preparing tactile teaching materials. In the next section I describe children's views on the collaboration created.

Table 23. Practices and outcomes through collaboration among children

Outcome of collaboration	How they Collaborated
Knowledge and skills	• Sighted children supported children with VI in and out of class activities • The children worked together in preparing tactile materials
Best use of time	• The children collaboratively collected locally available materials for preparing the teaching materials • Prepared material during vocational skills lessons • Sighted children read ordinary print text to children with VI
Motivation	• Children cooperated in preparing teaching materials • The children supported each other • All children were enjoying learning together
Practices	• Collecting, preparing and using teaching materials together • The sighted children supported children with VI in class activities • The sighted children were reading notes for children with VI • The sighted children supported teachers in supporting children with VI

7.4.4 Children's voices

As in the previous action research cycles, I interviewed the children with VI in cycle four. I wanted to obtain their views of the collaboration and how the

collaboration had improved their learning situation. The children viewed collaboration as something that had supported them in increasing performance in their subjects. They were also happier, and they felt more confident as their participation in classroom activities had increased and they were able to answer questions more independently. Zabu also said that the teachers' attitudes towards them had changed in a positive direction.

> Currently, we have increased our performance; we can ask questions and answer questions. The teachers are becoming friendlier. Sometimes after class hours the teachers ask how you found the lesson. This shows that they are caring for us. During class lessons presentations most of the teachers use names to point to some children to answer questions. [Zabu, Interview, September 2009]

The children believed that when supported they can learn better. They commented on the teachers' efforts to find possibilities to support their learning. When I interviewed the children with VI about their learning conditions in the school and how they participated in their classes, they said they enjoyed the way some teachers presented their lessons, they were able to remember what the teacher taught and they were motivated to learn (See Photo 10). Musa explained this in the following way.

> I enjoy the lessons in the class. The teaching materials available make me remember what the teacher taught, I can ask and answer questions, I like to be in the class and I am motivated to learn more. In Stadi za Kazi I learn skills like knitting, moulding, making chairs using manila sheets, which might help me in my after school life. Sometimes I am involved in preparing learning materials. [Poki, meeting, August 2009]

There were children who clearly stated that they had improved specific subject knowledge and skills and believed the project increased the interest in learning more about the subjects. Ngosi told me that he could now do several things like explaining to others using a teaching resource, doing examinations using tactile materials, and reading text during teaching and learning.

> I have learnt how to write well with spelling. The teachers provide a list of words in Braille and that helps me to understand how the word can be pronounced and how it is written. I can make a story or explain a diagram given. In geography, history and civics we learn about maps when previously we were unable to read them. But now we can read and understand different maps including contour maps. [Ngosi, Interview, August 2009]

Apart from learning spelling, one child with VI, Sambi, had the view that the use of tactile teaching materials made them feel valued and increased their academic performance.

> With the use of tactile teaching materials I feel honoured and therefore feel very happy. I can now read while in class using Braille text, discuss with my fellow sighted children, explain to my fellow children using TTM, and I can read maps. I can also produce a story using tactile teaching materials. [Sambi, Interview August 2009]

There were children who said initially they did not perform well in geography as they could not read a map. There were questions that required answering through reading a map. However as part of implementation of this project, teachers have prepared resources for them to use (See Photo 9,10,11). This indicates that with the use of TTM there are possibilities of increasing academic performance among children with VI.

> I was not performing well when it comes to reading maps. I can now do examinations that require map reading. Now I feel comfortable when I can show lakes, boundaries, and I feel happy when the teacher is teaching. I am performing well. I can now score 70% to 90% in examinations. I am happy with this project. [Zipo, Interview, August 2009]

In the class there was increased participation and leadership that increased motivation to learn. According to Ngosi, initially there was little interaction as only the sighted children had opportunities to use teaching materials prepared by teachers. Almost all the teaching materials used by teachers were for sighted children. Now the teaching resources were there for all to use.

> I have increased motivation to learn vocational skills as I participate in making tactile teaching materials. I have developed some leadership skills as I can stand and explain to others and lead a discussion. The teachers also support us in our learning and when we have problems we talk to them. There are times teachers ask me about the challenges I faced during the teaching and learning process. In the class there is increased understanding about visual impairment. Our fellow sighted children support us a lot during the teaching and learning process through reading for us and participating in discussions and monitoring the use of teaching and learning materials. [Ngosi, Interview August 2009]

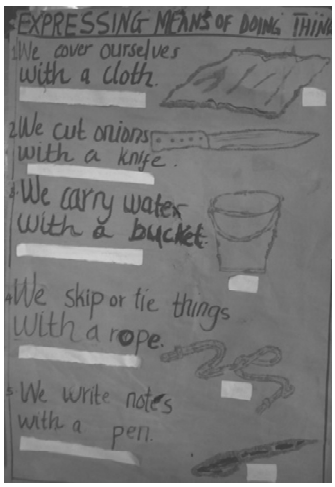

Photo 9. English Teaching Resource

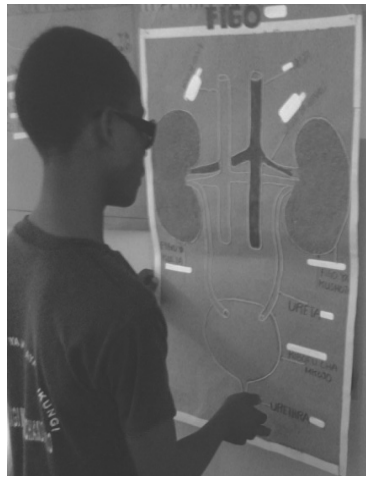

Photo 10. Poki using Science Teaching Resource

Photo 11. Geography teaching resource

The children started indicating some changes in teaching practices and participation in the teaching and learning process. The teachers facilitated the children's learning more than before. This was a good start for further improving

teaching and learning. It was made possible because the teachers evaluated lessons not only from their perspectives but also using the children's views.

7.4.5 Summarizing reflections and a way forward

As a result of improving teacher practices through collaboration the teachers developed the ability to reflect on their practices as a team of different experts with the same interest. The teachers became more positive to supporting children with visual impairment. They focused more deeply on the learning of the children, looking at issues on how to improve their practices through collaboration and to facilitate the learning of children with VI. They formed different kinds of collaboration: between sighted teachers and visually impaired teachers, teachers and children, sighted regular teachers and sighted teachers trained in special education. The collaboration of teachers and children helped the teachers to reduce time spend in preparing teaching materials, which also had positive transfer effects on vocational skills among the children. The project collaboration supported both teachers and children in developing their achievement, self-concept, knowledge and skills and the understanding and creation of effective collaborations within the school setting. The teachers saw the benefits of collaboration and the sharing of expertise as a way to develop professionally.

As a result of the discussions during the reflection meetings it became evident that the teachers had developed ownership of the action research project. They managed to explore their practices and challenges and later decided together on how to continue the work. The teachers told how they created collaborations within the school and how such collaborations supported them in developing their teaching practices. After this meeting, both I and the teachers decided to evaluate how the participation in the action research project had supported the teachers in facilitating the learning of children with VI included in their classes. In the next section I present the findings from the evaluation of the action research project.

7.5 Cycle 5: Evaluation of the action research project

In the last action research cycle the whole project was evaluated. All fourteen teachers participated in the evaluation of the action research project. Cycle five was implemented between 4th and 9th September 2009. The meeting held on 4.9.2009 was at the same time a reflection meeting of the activities and outcomes of cycle four and a planning meeting for cycle five. The activities in this cycle included gathering information from the teachers aiming at evaluating the project and investigating the impact of their participation in the action research project in their school context.

The activities in cycle five were meant to facilitate teachers in analysing and evaluating the action research project. I was interested to find out whether the

project had an impact on the practices of the teachers. Another interest was to evaluate whether the teachers' involvement in the project and the evaluation process could have a more far reaching aim – if the teachers were able to continue to develop and change their practices through periodical evaluation of their teaching practices and challenges associated with the practices. The analysis of the activities in cycle five indicated that the teachers had developed knowledge, skills and attitudes to evaluate change in their teaching practices. An overview of activities of the teachers and the researcher in cycle five is presented in Table 24.

My aim as a researcher in this cycle was to facilitate teachers in evaluating change and to evaluate the whole project. In order to reach that aim, I conducted interviews with teachers and the children, provided a questionnaire for the teachers and conducted meetings with them. I also observed classroom teaching. We discussed and reflected together during the reflection meeting. I also allowed a few days for the teachers to analyse their participation in the action research project and to involve the children with VI in the evaluation process.

During this cycle of five days (4-9.9) I arranged three meetings and collected data using several data collection instruments (Table 24).In the first meeting (4.9) the teachers and I agreed to reflect on what had happened in the school since the project was initiated. The teachers had a few days for this final reflection and evaluation. We agreed also that I should interview the teachers and the children. Also the teachers talked to the children with VI as a part of the evaluation. The teachers' findings on the children's perspectives and teachers' group discussions were presented during the reflection meeting on 7.9. In the reflection meeting the teachers formed groups of three teachers to discuss what they had achieved in the project. Results from the group discussion were then presented to the entire group of teachers for further discussion and reflection.

Table 24. Overview of activities in cycle five

Activity	Dates	Teachers	Researcher
Interview with the head of school	4.9		×
Meeting with teachers	4-9.9	×	×
Teachers evaluating their participation in the project	4-9.9	×	
Observation and Interview with teachers	4-9.9		×
Interview with children with VI	4-9.9		×
Reflection meeting with teachers	7.9	×	×
Supervising filling in of the questionnaire	8.9	×	×
Final reflection meeting	9.9	×	×

After the teachers had presented their discussion results I provided them with a questionnaire to fill in individually under my supervision for the purpose of eliciting individual teacher accounts of the project. I did not allow discussions

because I wanted to have the teachers' individual views. The two teachers with visual impairment were supported by teacher colleagues (not involved in the project) in filling in the questionnaire. The questionnaire had questions that reflected all the activities done in the project. Besides background information about the teachers I also included questions about their views about including children with disabilities in their classes. They were asked to explain whether they got any benefits by participating in the action research project. The teachers were also asked to rate some aspects of the action research project on a Likert scale type (Appendix 1). The filling in of the evaluation questionnaire was done on 8.9. On 9.9 all the teachers and the researcher had a final reflection meeting with discussion that focused on what had happened from the beginning of the project to the end. In evaluating the action research project a number of tools were used in order to obtain a detailed account of the project. This choice was made to ensure trustworthiness.

In the next sections (7.5.1.-7.5.8) I present the findings from the evaluation. The focus was on how the teachers changed their practices as a result of their participation in the action research project. The findings are based on the questionnaire, the interviews with teachers and the children, and statements from group discussions in the meetings. While observing classroom teaching I had a checklist that supported me in rating participation of the sighted and visually impaired children during the teaching and learning process. All 14 teachers answered the questionnaire, were interviewed individually and attended the meetings. I begin with the views of the head teacher, whom I interviewed on September 4th.

7.5.1 Head teacher's views of the project

In the interview with the head of school I asked about his views on the project. I wanted to know his general views about the project, the challenges faced in implementing the project, if there were any success stories and suggestions for future improvement of such action research projects and the possibilities of scaling up to other schools. The head of school told me that he was impressed with the implementation of the project and commented on the project positively.

> I find the project has been useful. Initially when we started I felt it would be difficult. But I found teachers increased their enthusiasm as the project proceeded. As a trained teacher in special education, my fellow teachers continued consulting me in areas where they found difficulties. I also found a number of collaborations were created. Teachers were open to children with VI on their views about the teachers' teaching practices. This is interesting and needs to continue. I would suggest this program be copied as a professional development for teachers at district levels. [Mselem, interview, September, 2009]

The head of school also participated in the study as a class teacher. He was teaching science in class six in the school. According to his explanations it could be concluded that he was interested in the project. He compared the situation in the school before the project and said there was an increased supply of teaching

materials that supported children with VI in the school. He further commented that the teaching materials continued improving in terms of quality and quantity. He also mentioned improvements in teachers' choices of strategies and methods. One improvement according to the head teacher was involving the children. The teachers started reflecting and doing research type activities before deciding on what strategies and teaching resources to be used. After teaching their lessons they asked the children about their satisfaction and dissatisfaction in participating in the teaching and learning process. The research type inquiry among the teachers before acting characterized the change in teachers' practices. The teachers seemed more conscious about their teaching than before.

> Initially I had challenges in the availability of teaching materials, but now though the teachers cannot prepare all of them, they have tried to improvise teaching materials that support the learning of children with VI. In ensuring materials are available, both VI and sighted children are also involved in preparing their teaching materials. In this respect the project has increased the usefulness and effective use of skills taught in Stadi za Kazi. [Mselem, interview, September 2009]

The project according to the head of school had proved to be more successful than challenging. When asked about challenges, the head of school said that the project itself was good and that the challenge was how to integrate it in the system of education and how it could be recognized in terms of certification and teacher incentives to teachers participating in such activities.

> I see the challenge seems to be its acceptance in our education system as a form of empowering teachers in addressing challenges. There is a need for the education system to recognize teachers who participate in activities that focus on improving access to and success in education for all learners. Its recognition can be in the form of awards or promoting or any kind of incentive system. This would keep teachers interested. Also it can be included as a course in initial teacher preparation. [Mselem, interview, September 2009]

The project results indicate that there were teachers who had understood that knowledge and skills can develop also in different ways, including change of teaching styles as they participate in action research. In the case of Maisha Primary School, knowledge and skills in preparing teaching materials were important as children with VI had no books to read and depended on teacher facilitation only. Thus, the children with VI depended on the ability of the teachers to acquire knowledge and skills and to facilitate their learning.

> With the shortages of teaching materials experienced, as a head of school I noticed through collaboration the teachers improvised teaching materials. Especially the collaboration between sighted teachers and teachers with VI was important for creating teaching resources in the school. As a head of school I supported teachers in ensuring that they collaborated. I had discussions with teachers during staff meetings. [Mselem, interview, September 2009]

The head of school commented that during collaboration the teachers realized there was a need to have short courses on inclusive education for all teacher categories, also for regular teachers with VI. In Tanzania teachers with VI are trained as regular teachers. However, no special attention has been given to

providing special needs education skills for them. Short courses that enhance teachers' knowledge and skills in managing children with special needs rarely include teachers with VI. The head of school said that teachers with VI would need more knowledge about special needs so that they could be competent in delivering lessons in classes including persons with disabilities.

> The district education offices should prepare short courses on inclusive education for both sighted teachers and teachers with visual impairment instead of preparing seminars for sighted teachers only. Such professional development courses should use active teaching methods, where teachers practice what they have learnt. Later, such skills would be extended to the school. In inclusive seminars the sighted teachers would be taught how to include children with disabilities. It could be a good idea also for the teachers with VI to learn how to include both sighted and children with VI in their teaching. [Mselem, interview, September 2009]

In summary, the head of school was positive in the implementation of the project and provided help to teachers during the action research process. Further, the head of school viewed the project as one of the solutions to the challenges facing inclusive education, where many teachers are not trained in special education. Generally, in inclusive education the classes are for everybody, regardless of abilities. Where there are diverse learners teachers as experts need to be encouraged to support each other and to support children in their learning. In this project, especially in cycle two to four, a large proportion of the teachers became developers of their own work and developed resilience strategies. In the next section I describe the participating teachers' views. The findings are based on questionnaire, interview and observation data.

7.5.2 The teachers' views of the project

In the questionnaire the teachers were asked to give their views of the action research project, the activities in the project and the outcomes of their participation. The teachers were also asked if they would participate again if the project were to be repeated. The results from the questionnaire could be grouped mainly into five main themes/ dimensions: collaboration, teaching and teaching materials, knowledge and skills, and changed teacher practices. In Table 25 a summary of the findings are presented. The statements in the table are examples from the teachers' individual questionnaire answers.

Table 25. Teachers' views on the action research project

Dimension	Teachers' statements
Collaboration	I collaborated with Amos to prepare Braille texts (Agnita) I collaborated with teachers with VI in preparing and using tactile teaching materials (Clara) My collaboration with children with VI increased (Betty) My collaboration with my fellow teachers increased (Msigalila) I managed to use co-teaching (Baraka)
Teaching and teaching materials	I prepared tactile teaching material, for example I prepared organizational charts (Amos) I prepared tactile materials (Antonia) I used Braille texts and tactile teaching materials (Esta) I developed games for children with VI with support from Mselem (Benjamin)
Knowledge and skills	I learned how to identify children's learning needs (Mercy) I learned how to support children with VI and reduce barriers in their learning (Agnita) I developed knowledge in teaching children with VI (Betty) I developed knowledge and skills in preparing and usingtactile teaching materials (Esta) I increased class management skills (Boni)
Changed teacher practices	I increased my choices of teaching techniques (Clara) I learned different teaching strategies (Edina) I changed from being a regular teacher to a teacher teaching in an inclusive class (Msigalila) I learned what is good for children with VI is good for all (Betty) I learned that teaching materials support teachers in changing teaching strategies (Msigalila)
Support systems	I decided together with the teachers to set up a room in the school for preparing and storing TTM, a resource room (Mselem) I appointed a teacher responsible for the development and use of TTM in the school (Mselem)

Source: Field data (September 2009)

Below I describe the five main outcome categories. The findings are based on data from the interview with the head of school, interviews with teachers, the questionnaire answers and the two evaluation meetings conducted before and after filling in of the questionnaire.

Collaborations

In implementing the action research project at Maisha Primary School, teachers and children formed collaborations that supported them in implementing change in the school. Through collaborations the teachers helped each other in their day to day activities to ensure children with VI learned better. The teachers evaluated

the created collaborations positively as they contributed to increased ability of regular teachers to support children with VI and increased the supply and improved the quality of teaching and learning materials. Through collaborations the teachers shared experiences, knowledge and skills. Clara, one of the Kiswahili teachers, expressed these ideas in an interview.

> I would say I have increased collaborations with my fellow teachers. I collaborate with both sighted teachers and teachers with visual impairment in reducing barriers to learning of children with VI included in classes I teach. Teachers with visual impairment support me in validating teaching resources. Teachers teaching Stadi za Kazi support me by teaching children skills which later on they practice by making teaching and teaching materials. I collaborate with teachers trained in special education in planning lessons and choosing the method of lesson presentation. [Clara, Interview September 2009]

Apart from the collaborations among teachers, the collaboration also involved the children. The children both sighted and those with VI assisted the teachers in making materials. Msigalila, a mathematics teacher, talked about the benefits of the collaboration with the children.

> The collaboration was extended to children. Children with VI used the teaching materials and were given a chance to comment on the teaching materials. Comments from the children were used in modifying the teaching materials for future use. The sighted children assisted the teachers in preparing concrete teaching resources that supported their learning and the learning of children with VI. [Msigalila, Interview, September 2009]

According to the teachers, the increased collaboration between the different teacher categories (regular teachers and special education teachers) had many positive outcomes. The teachers' increased ability to prepare and use tactile teaching materials led also to their increased abilities to teach in an inclusive classroom. However, the collaboration also had other effects. The teachers revealed that collaborations created new relationships and interactions and increased communication and problem-solving skills. The reflection meetings were an important arena for collaboration. It was during the reflection meetings that problems were solved. For example, when teachers faced difficulties in writing descriptive Braille text in TTM, the collaboration between sighted teachers and teachers with visual impairment was established for the first time and then continued on a regular basis. Thus, most of the teachers indicated positive outcomes from the project regarding the new ideas and skills they obtained. Boni's, (mathematics teacher), questionnaire answer is an example of how the project helped teachers to acquire new skills through collaboration.

> Because I am not a specialist teacher teaching in a school including children with VI, I learnt different strategies to support children with VI. This project supported me in understanding that there are possibilities for enabling children with VI to participate in class activities like their sighted peers. I learnt a lot, and when using tactile teaching materials, both the sighted children and children with VI benefit. Through participating in this project, I got many ideas from my fellow teachers as we were collaborating on issues like preparing teaching materials, and teaching strategies. I would be happy if the government would set aside a budget to support children with

> disabilities especially in buying equipment that support their learning. The children liked my teaching when I used tactile teaching materials. [Boni reflection meeting September 2009]

The descriptions from the teachers indicate that the teachers had begun to collaborate in a systematic way during the project. This collaboration made all teachers have a positive view of their involvement in the action research project. It can be concluded that the teachers' change of practices was a result of collaboration created during implementation of the action research project in the school.

Teaching and teaching materials

The teachers revealed during evaluation that they managed to change their teaching practices through the use of TTM. They pointed out that the use of tactile teaching materials supported the learning of all children, not only children with VI. However, the children with VI benefited most from the tactile materials. The regular teachers at the beginning of the project were used to visual teaching materials and unfamiliar with tactile teaching materials. They thought that they could use visual teaching materials also for children with VI, but soon realized that visual teaching materials are not user-friendly to children with VI. All the teachers acknowledged they had managed to teach all children using the tactile teaching resources. Finally, they realized that the use of concrete materials supported both sighted children and children with VI in their learning. Benjamin, the personality and sports teacher, gave the following comment in the reflection meeting.

> I managed to prepare tactile teaching resources. The tactile teaching resources were useful to all children. After this realization I had to plan further how to prepare such materials in large quantities. Together with other teachers, we agreed to prepare more teaching materials and collaborated with both teachers and children in preparing teaching materials. [Benjamin, Reflection Meeting, September 2009]

According to the teachers' responses in the questionnaire and in the interview, I came to the conclusion that the teachers had improved in the preparation and use of tactile teaching materials. At the end of the project there were a large variety of different kinds of teaching and learning materials: normal drawings, tactile materials such as maps and charts with text in Braille, and passages from books written in Braille print.

This meant that the sighted children as well as those with visual impairment had resources to use during the teaching and learning process in the classroom. Based on the statements from the teachers I could conclude that there were positive changes in the teaching and learning process that had occurred during implementation of the research project.

The increased school achievement of children with VI at Maisha was a result of teachers' participation in the project. During the project implementation the teachers collaborated and supported each other in creating teaching materials that were friendly to all learners. About half of the teachers reported they had

developed abilities in planning, developing and implementing classroom strategies that were solutions to the challenges they had been facing. The ability to identify needs, to form and maintain collaborations, prepare and modify learning resources, and plan lessons that take into consideration children with VI assisted the teachers in developing and building creativity in dealing with the challenges they faced. Clara, one of the Kiswahili teachers, gave the following statement.

> As a teacher I developed skills in motivating children to learn and to be fond of my subject, skills in reducing learning barriers to children with VI, and also I developed knowledge and skills in building creativity to children with VI through planning, developing teaching resources, using teaching resources and monitoring and evaluating the learning progress of children in my class. [Clara, reflection meeting, September 2009]

According to Edina, participation in the project increased her interest in knowing more about special needs education. This realization might have come when she was engaged in preparing learning resources and had to consult the special education teachers and the teachers with visual impairment.

> I have learnt to prepare teaching resources. I have realized that as a teacher if I use teaching resources that accommodate the needs of children with VI, they understand the lessons easily and become curious. Personally, I have developed an interest to know more about special needs education. [Edina, Reflection Meeting, September 2009].

Amos, a history and civics teacher with VI gave an interesting comment in the meeting. He said that for the first time in his teaching career he was able to use tactile teaching materials during the teaching and learning process. The use of TTM was possible as he was supported by sighted teachers during lessons.

> As a teacher with visual impairment I have learnt during my participation I this project that using tactile teaching materials support children with VI in their learning. I learnt also that collaboration is one of the means to support teachers to develop skills that they did not have previously. Through the use of tactile teaching materials most of the teachers became more aware of the teaching children with disabilities. Now I can involve children with VI in their teaching and learning process. I also learnt that persons with visual impairment, if facilitated, can learn skills to prepare their teaching resources and skills that would make them lead an independent life. To learn life skills, participation in class activities and out-of-the class activities needs to be enhanced through the use of TTM. [Amos, reflection meeting, September 2009]

Based on the evaluation in cycle 5 I could conclude that the teachers had learnt to prepare and use tactile teaching materials. The preparation process also led to collaboration between the teachers and the children (as described in the section above).This also seemed to have had an impact on the learning achievements of the children with VI. They were able to point out many positive learning effects compared to the situation before the project, for example increased knowledge and skills in spelling, writing, creating stories from a picture, reading maps and participating in class activities. The children also said they had learnt to ask help from the teachers with confidence. Zabu's statement can exemplify this.

> I have learnt how to write spelling correctly. The teachers provide a list of words in Braille and it helps me to understand how the word can be pronounced and how it is written. I can make a story or explain a diagram given. In geography, history and civics we learn about maps, and previously we were unable to read maps. But now we can read and understand different maps, including contour maps. [Zabu, interview September 2009]

The teachers were of the opinion that they had progressed in developing teaching materials that supported children with VI, developed their caring skills and built cooperation among children and among teachers and children. The achievement made each child feel welcomed in the classroom.

Teachers' knowledge and skills

From the interviews in cycle 5 it was evident that the teachers were looking at teaching from a different perspective. The teachers commented that they had developed skills in teaching an inclusive class. An inclusive class is a class that welcomes all children to learn, facilitates the learning of all children and meets the learning needs of every child. The teachers reported that they had developed different skills: to collaborate, to identify and solve challenges in teaching and learning, to identify the learning needs of children, to prepare and use tactile teaching materials and to prepare Braille text for children with VI. These developed skills supported the teachers in teaching classes which included children with VI and thus enabled them to meet the learning needs of all children. Teachers developed knowledge and skills in teaching children with VI through participation in the project activities and especially through the process of preparing, developing and using tactile teaching materials. When they collaborated with their fellow teachers, they learnt how to prepare the resources, how to use the resources, how to identify the learners' needs, and evaluate their teaching and learning process. During the meetings the teachers also had possibilities to ask questions about the materials and share experiences with other teachers. This reflection was likely to develop the teachers' knowledge and skills. In collaboration with others they became more innovative.

> I have learnt skills in how to prepare and modify teaching materials through both teachers with visual impairment and children with VI. I have developed knowledge and skills in determining the needs of children with VI and noted that children with VI have unique needs that need to be addressed. To address their needs I have had to be close to them and listen to them. I learnt that to create teaching resources I needed to focus on the children's needs. [Edna, Interview September 2009]

The improved knowledge and skills among the teachers also had other effects. They were more concerned with the children with VI than they were before the project started. There were changes in the teaching and learning environment in classes including children with VI that were noticed during the evaluation. Some teachers acknowledged that the project had made them like more the subject they teach in classes including children with VI. The teachers Msigalila and Edina exemplified this in an interview.

> In participating in the project I got knowledge and skills in preparing inclusive teaching materials. In preparing the teaching material I had to collaborate with other

> teachers with knowledge and skills to prepare the materials and also had to collaborate with children to prepare more TTM. Above all, the project has made me like more the subject I am teaching in a class including children with VI. I have realized that persons with visual impairment can learn if facilitated. I learnt also that the government is considering persons with visual impairment through providing and allowing school development programs like this to take place in a school….. [Msigalila, Interview, September 2009].

> There are many things that I have learnt in participating in this project: firstly, to be keen when preparing a lesson to be taught in the class including a child with visual impairment as you have to think about the child first on how you will teach the child and understand the lesson in the short time allocated for teaching (40 minutes); secondly, the project has enabled me to make impartial learning materials that cater for the needs of all children, both sighted and children with VI. Thirdly, the lesson becomes easier when you use teaching materials that cater for the needs of all learners in the class. Fourthly, this project has enabled me to be closer to all the children than before, especially the children with VI. [Edina, Interview September 2009]

Both the teachers and researcher identified aspects of knowledge and skills that had been developed by both teachers and children. The teachers developed knowledge and skills in preparing and using different teaching resources. The teaching resources increased the teachers' ability to facilitate the learning of children with VI included in their classes. On the whole, the participating teachers changed their practices as a result of the involvement in the action research project.

Change of teaching practices

In the beginning of the project the learning of children with VI in the school faced a number of challenges. The teaching methods the teachers used were not always suitable for the children with VI. The teachers lacked knowledge and skills to support children with VI in the teaching and learning process. There were barriers to learning that the teachers experienced, but they did not know how to remove these. They used the teaching methods they had been introduced to during their teacher education. Gradually during the project, the teachers changed from teacher-talks-student-listens methods and teacher-centred methods to multisensory teaching practices. Agnita gave an example of the change in the interview.

> In the past I did not involve children with VI in my teaching and learning process. I did not encourage children with VI to respond and/or ask questions. With use of Stadi za Kazi subject, where children with and without disabilities are taught skills to prepare TTM, the amount of TTM in the school has increased. With the increase in the amount of TTM the teaching and learning has changed from being teacher-centred to learner-centred. [Agnita, interview, September 2009]

The use of teaching materials increased the communication and interactions in the classroom. The use of multisensory teaching materials encouraged children to talk to each other as all had access to the teaching materials. The head teacher,

Mselem, and the special education teacher, Mercy, talked about their changed strategies.

> Initially, it was seldom you would see a child with visual impairment raising their hand during the teaching and learning process as a sign to want to answer a question. But now it is common. Similarly, as a teacher I have changed the communication of appointing a child to answer using the words, "you", "next" and the like. Now if someone raises their hand in answer I call them by name. This has made my language in the class to be more inclusive and increased the participation of children with VI in their learning. [Mselem, reflection meeting September 2009]

> As a teacher trained in special education and participating in the project I have learnt different strategies and techniques to support the learning of children with VI and sighted children learning in the same class. I learnt this through collaboration with other teachers in the preparation and use of teaching resources and developed different teaching strategies that make children participate in their learning. [Mercy Reflection Meeting September 2009]

The teachers used teaching materials that supported the active learning of children with VI, which was not a common before the project. The activities developed were new to both teachers and children with VI. The learner-centred teaching methods became evident as the project proceeded with the development and use of teaching materials. On the whole, the teachers who participated in the project evaluated positively the development of their teaching practices. The teachers believed that the action research project supported them in developing their teaching. This might be a result of the collaborations created and implemented during the action research process.

Support systems

The teachers thought that support is needed. In this study the teachers received support from each other and from me as facilitator and researcher. Apart from this kind of support the teachers believed that government support is needed in order to maintain the best practices developed. They also suggested government support for school-based professional development. Courses and workshops outside school seldom lead to sustainable results. When teachers attend professional development programs outside their own school context, they might not be able to apply the new knowledge because of lack of material and equipment. On the other hand, if the professional development program is implemented in the school context the teachers learn to use the available material and resources. This was seen in this study. The English teacher, Agnita, talked about these topics in the interview. Also Amos talked about government support and suggested professional development courses for teachers with disabilities.

> I think government support is needed. Teachers need to be remunerated and recognized for any change they make in the school. In the case of implementing inclusive education, there is a need to have experts who would support teachers in their work. Use of school-based professional development would reduce the cost of travel and give teachers possibilities to become researchers of their own teaching by

> evaluating and making informed decisions in trying out some skills and changing practices within the school context. [Agnita, interview, September 2009]
>
> I feel the project has made good changes in teaching and learning. I can now use teaching materials during teaching and learning. This is my first time to use teaching materials where both sighted and a child with VI benefit. I suggest now the government should start providing professional development courses for teachers with disabilities. This would help us improve our teaching process. [Amos, interview, September 2009]

Also the head of school viewed the program to have supported the teachers in reducing barriers to learning among the children. According to him, the teachers had started including all children when preparing and using teaching materials suitable for all learners. He also created possibilities for the teachers to continue preparing material and developing their practices by establishing a resource room in the school. On the whole the action research project at Maisha Primary School had a positive impact on the school community.

7.5.3 Children's views of the project

In this section I present the children's experiences of the whole project. I interviewed the children in order to find out their opinions and experiences. I interviewed the children with VI using an interview guide and had both individual and group interviews. I wanted to know if they could identify the same positive effects that the teachers had identified. Based on the findings, I could conclude that the children were positive. They were also able to describe how the project activities had increased their potential to learn. Ngosi, a visually impaired class six pupil, viewed the use of teaching resources as having increased his ability to learn and perform. The teaching resources were manageable as they could be used in the classroom with ease. He commented on the outcomes for him personally in the following way.

> Before starting the project I was not doing well in my studies. By now I am scoring high marks; sometimes I get even 80% - 90% in my assignments and examinations. I propose this project to continue, as it has made me more proud of being a pupil. In the class my sighted peers support me a lot now. [Ngosi, reflection meeting, September 2009]

To Safi, the project was beneficial as it made him perform well and he could also get assistance from his peers as they all used similar teaching resources.

Zabu was of the opinion that he enjoyed lessons and had developed his academic potential when he participated in doing exercises with his sighted peers. He had increased his participation in group discussions, games and sports, and in reading passages in the classes. The participation made him feel more included than before, not only in the classroom activities but also in the outdoor activities. According to Zabu, teachers need to be supported so that they deliver well in schools. According to him, this can be accomplished by the government and non-governmental agency support for schools that face challenges.

> I am happy that I am involved more in class exercises and that I understand when teachers teach the lesson. I participate in games and sports. By now I am also sometimes leading a group in singing and traditional dance. I feel teachers have changed the way they teach us. I feel more included. When there is a teaching resource that teachers use to illustrate a concept, they also prepare a tactile resource for me. I would suggest that society and the government should support teachers in developing more skills in improvising teaching resources. [Zabu, Interview September 2009]

Zipo, from class six, was of the opinion that the project had increased his performance as he was now able to write with correct spelling in both English and Kiswahili. To him, tactile teaching resources were a catalyst to improving his learning process. He also felt more included than before.

> I felt included in the school and class activities. It felt important. Using tactile teaching materials enabled me to write correct spelling both in Kiswahili and English. When most of the learning depended on listening, I used to make a lot of spelling mistakes. The project has raised my academic performance and expectations. [Zipo, interview, September 2009]

Zabu talked about the changed behaviour of the teachers. They had become friendlier and more concerned. This had helped the children with VI to be active during the lessons. Also Safi expressed the same kind of ideas. He felt more independent and confident because the teachers seemed to be interested in his learning and listened to him.

> Currently, we have increased performance; we can ask questions and answer questions. Teachers are becoming friendlier. Sometimes after class hours the teachers ask how you found the lesson. This shows that they are caring for us. During lesson most of the teachers use names to get children to answer questions. [Zabu, interview September 2009]

> I feel more independent and confident. I can ask questions without the support from sighted peers. I can also explain using a teaching material like the sighted peers. The project has made me feel happier and be involved in the teaching and learning process. I like the way the teachers involve me in evaluating their lessons. [Safi, interview September 2009]

The children believed that the teachers used the skills acquired during implementation of the action research project during the end of term examinations in May 2009. During the marking of the examinations the teachers compared the children's performance between the previous end of term examinations in November 2008 and those of May 2009. All the teachers reported that the children with VI had increased their academic achievement and that they were more confident during examinations. During this examination the teachers used tactile teaching materials including maps, and asking children to label parts of the human body. These practices helped the children to perform according to their level.

The children's comments indicated that the project had a positive impact. The positive effects were visible during the teaching and learning process. The children performed better and they felt more included. These changes were a

result of the teachers' engagement in preparing, using and improving teaching resources for children with VI included in their classes. While implementing the project the teachers were sharing experiences, reflecting together and collaborating, which developed their skills in preparing and using the material during teaching. Also the teachers' practices changed, which had positive effects on the whole school situation of the children with VI. During implementation of the project the children improved their social relations, self-esteem and created a positive self-concept that resulted in improved academic achievement by both the visually impaired and sighted children.

7.5.4 Researcher's final reflection

The last action research cycle aimed at evaluating the whole action research project and investigating the impact of the teachers' participation in the action research project at Maisha Primary School. My role was to support the teachers in investigating the impact of the action research project in their teaching practices. The teachers actively participated in the evaluation of the action research process and in cycle five were given the opportunity to evaluate their participation in order to determine whether or not there had been successful changes. In determining the teachers' views I used interviews, meetings, observations and administered a questionnaire. I also interviewed the children with VI using an interview guide. Using more than one tool provided me with opportunities to obtain views from the teachers on whether the participation in action research provided chances for them to solve challenges they had identified. Interviewing children with VI gave me an opportunity to explore if changes made by teachers in the classes were benefiting them and had had any impact in their learning process.

On the whole, the teachers and the children with VI had positive views on the action research project. The teachers managed to solve challenges they faced in the teaching and learning process and the children with VI managed to improve their school achievement. This could clearly be seen in the data collected during evaluation. This gave me as researcher in the project an opportunity to reflect upon the possible reasons for the positive results. One of the reasons might be that the teachers were positive from the beginning. The school had participated in the first phase of the project in 2008 and the project was familiar to them. They probably saw a possibility to improve their teaching and daily activities.

In this action research project my role was to facilitate change by involving teachers in identifying, analysing, prioritizing, deciding and acting on the agreed challenges to solve. My role was also to study the process of change. The children were made active as they participated as learners in the process. Their opinions were of great value for the teachers and for me as researcher. The development of mutual relations and making teachers own the process, were successes of the study. The teachers participating in the project revealed that action research, where effectively used, is likely to support teachers in developing their teaching practices. In this project the teachers became

acquainted with skills to determine specific problems in their teaching, and in prioritizing and addressing the challenges. While solving the problems and having reflections, they were encouraged to work together. It was the collaboration that led to development and change. The teachers created a common understanding of their challenges and solutions. It seems they were empowered as they were able to analyze, reflect and learn about their classroom realities and thus created a basis for transforming their realities in order to reach the goal – to enhance the learning of children with VI included in their classrooms.

For example, when teachers decided to prepare teaching materials, some of them tried to make normal letters tactile. It was during a reflection meeting when some of the teachers noted that children with visual impairment cannot read normal tactile letters. This resulted in collaboration with teachers with visual impairment. The teachers also found that time to prepare teaching resources was inadequate and embarked on using the Stadi za Kazi (vocational skills) skills to prepare teaching resources, and therefore collaboration extended from teachers to children. In the near final stages of the action research project, the teachers decided to assess their progress and how they could enhance the skills they had developed. It can therefore be concluded that participation in an action research project can be one of the strategies to develop teachers' skills in creating awareness and trying out different strategies to improve the quality of teaching in inclusive schools.

After having evaluated the project I also realized that I had developed in my role as researcher. It was not clear to me from the beginning what the process would be like. I did not have full control over the research activities as I would have had if I had chosen a more traditional approach. However, I soon realized that in order to understand and gain knowledge of the teachers' change process I needed closeness as well as distance. Closeness allowed me to be part of the teachers' activities and to reflect and to learn together with the teachers. But in order to interpret and understand I also needed distance. I tried to bridge theory and practice.

8. Discussion

The aim of this study was to contribute to increased knowledge and understanding about how teachers can change their teaching practices and thus facilitate the learning of children with visual impairment included in regular classrooms as they participate in an action research project. Thus, the teachers' change process was the focus of the study. I wanted to study the process of change because earlier studies (Bagandanshwa, 2004, Mmbaga, 2002; Mwakveja, 2013) and also my own pilot study in 2007 (Mnyanyi, 2007b) had shown a need for changing the teaching practices in classes with visually impaired pupils. The chosen methodological approach gave me the possibility to research not only about action (the changing of practices), but also in action. The research was born out of a desire to transform inclusive education services in my country, to change teacher practices and to enable me to learn more about how children with VI can learn better. I wanted to know whether action research would be an effective tool for promoting inclusive education in the Tanzanian context. The main assumption was that teachers can change their teaching practices in classes enrolling children with VI as they participate in an action project in their authentic school context alongside their normal teaching activities. The teachers who participated in the action research project in Maisha Primary School analysed their practices and challenges. As a result of systematic reflection and analysis, teachers developed new teaching strategies and practices that facilitated the learning of children with VI. The teachers succeeded in improving the learning outcomes of all children (with VI) enrolled in the classes they taught. The teachers became researchers of their own practices in the authentic school context.

The discussion in this chapter is primarily focused on the outcomes of the action research project. I analyze the findings and attempt to place them into a broader perspective which deals with the implications for the development of special needs education in Tanzania. I also discuss the contribution of my study to the research field. However, I begin with a discussion about the methodology in the study. Later I discuss the main findings, relevance of the study, implications of the study, limitations of the study, followed by concluding remarks and suggestions for further research. I also add a postscript which presents results obtained after 5 years from the time of the original data collection.

8.1Methodological considerations

In this research project I studied how the teachers changed their teaching practices as they participated in the action research project. The question was whether the teachers could change their teaching practices. If so, what would make them change? The context of my actual study was limited to one rural school enrolling children with VI. My research included teachers and children with VI. My method was a collaborative action research. This approach was used in order to search for a deep understanding of existing school realities and also to produce tangible results for the school. The starting point of the study was a pilot study that was conducted in 2007. The results from the pilot study indicated that there were many practical problems in the schools enrolling children with VI that needed change. I chose to use action research, which takes into account how humans interact and respond to events in a certain situation, aiming at improving a real situation as they gather and process the information, reflect, plan, act and evaluate (Armstrong & Moore, 2004; Borg, Karlsson, Kim & McCormack, 2012; Hatfield, 2006; Joyce & Showers, 2002; Lunenberg, Ponte & Van de Ven, 2007; Mattsson & Kemmis, 2007; McNiff, 2010; Stjernström, Lund & Olin, 2006). In choosing action research as my methodological approach, I took a deliberate risk as I was not sure how the school and the teachers would react. Action research is not a natural process which teachers do in their day to day activities, but requires commitment to collaboration, to consensus and to reflection (Hammond, 2013). A vast body of literature from developed countries indicates that collaborative action is effective in reducing exclusion in inclusive classes, as it minimizes the dichotomy between theory and practice (Armstrong & Moore, 2004; Cochran-Smith, 2005; Nonaka & Takevch, 1995; O'Hanlon, 2003; Peter, Johnstone, & Furguson, 2005; Tragoulia & Strogilos, 2013). However, I was not sure whether this would apply to schools enrolling children with VI in a Tanzania, a developing country with many challenges in implementing education, ranging from physical, fiscal and human resources (Omari, 2014; Tungaraza, 2014).

My role in the research process was to create an opportunity of being on the inside, as the intention was to uncover the barriers to inclusion from the perspectives of those on the inside, the teachers and the children with VI (cf. Moss, 2012). In studying the change process I was close to the participants, and at the same time distant. Although I had decided who should participate in the research process (teachers teaching pupils with VI from grades 4 and 6), I allowed the process to go naturally. This helped me to understand how teachers can change practices by analysing and manipulating the existing reality in the school. In order to understand I had to follow the research process closely. The closeness provided me with an opportunity to investigate the teacher change process (cf. Mertens, Sullivan & Stace, 2011). The closeness gave me access to

the classrooms and to the teachers' views. I knew their challenges, and together with them I actively looked for solutions. I tried to create an atmosphere of openness and honesty. Also the closeness to the children gave me an insight into their reality. Because of the closeness and familiar atmosphere I created during the meetings with the children, they felt free to express their views. However, closeness can also become an obstacle for the research process and make the researcher too involved. I was aware of this risk, but as I did not spend more than five days in the school during each action research cycle, I managed to avoid the risk.

I was also aware of the problems of change resistance, power distribution and other factors that might lead to a failure of the collaborative action research project. According to Sangani and Stelma (2012), factors hindering teachers engagement in reflective practices are, for instance, the hierarchical nature of the education system, lack of autonomy at different levels, absence of a culture of openness, challenging working conditions, financial and other resource constraints, lack of pedagogical and content knowledge, and the extent to which reflective practices are supported. These factors were evident in this project (see chapters 2 to 4), but they did not affect the project and the project outcomes in a negative way. The contextual constraints were part of the reality, and everyone knew that these kinds of frame factors could not be changed very quickly. The question of power to resist change did not manifest itself, as school leaders (head of school and the school academic master) were part of the project. There was a common understanding that all teachers needed a change of practices; also the school leaders (cf. Webb, Vulliamy, Sarja, Hämäläinen & Poikonen, 2009; Weiner, 2014). As such, the project had the full support of the school management. If the school leaders had not been positive, the results of the project might have been different. In such a situation resistance to change might have been more common. My impression from the beginning was that there was a shared desire to improve the children's performance. Another factor which might have influenced was the fact that the head of school was a trained special education teacher (specialized in visual impairment) and thus had a vested interest in increasing the participation of children with visual impairment enrolled in the school.

In order to study the change process I collected data using many different data collection tools. I regard the interviews and meetings with the children and the reflection meetings as important data collection methods. All the chosen methods complement each other, but without the children's views the results of the study might have been different. It was important for me to see the change of practices and what the change meant from the children's perspectives (cf. Lamote & Engels, 2010; Yost, Sentner & Forlenza-Bailey, 2000). According to Thomson (2008) and Schiller and Einarsdottir (2009), the voices of children with disabilities need to be heard in order to have ways of investigating their lives. It would also have been fruitful to include children without disabilities. I could also have included school committee members who are empowered to take

over the oversight and development roles in their respective schools (Manara & Mwombela, 2012; Masue, 2010). However, I decided not to do so, because I wanted to focus on the teachers and the children. Of the chosen data collection methods, the reflection meetings were essential for the whole action research project. The reflection meetings used open discussions for consensus building. Through facilitated sense-making the participants' co-generated transformational theories of practice, which finally captured explicit knowledge in the form of new strategies and practices that helped the change process go forward. I facilitated the reflection meetings, following a basic action research format of observing (what is happening now?), reflecting (what does this mean?), planning (how can we plan in order to change?) and acting (what needs to be done?). These questions apart from being used in the reflection meetings appeared also in my interview with the teachers and with the children.

The teachers were responsible for actions and decisions during the project implementation. In this way, I was distancing myself when creating opportunities for the teachers to practice a developing inquiry culture, solidarity, critique practices previously taken for granted, open communicative spaces within the school and to reflect and share experiences, both as individual subject teachers and as a group of regular teachers (cf. Mattsson & Kemiss, 2007; Webb, Vulliamy, Sarja, Hämäläinen & Poikonen, 2009). In this project the teachers were actively changing their practices guided by the co-generated knowledge during reflection meetings (cf. Postholm & Skrøvset, 2013). My aim was all the time not to decide for the teachers (top down); instead, all actions were implemented from the teachers' perspectives (bottom up) (cf. Nunan, 1994; Sangani & Stelma, 2012; Weiner, 2014). My task was to record and to document. Sometimes there might have been a temptation to interfere. I entered the research process with perspectives shaped by my own unique experiences of the education system in Tanzania and of inclusive education in particular. Because of my long experience of being a school inspector and teacher educator I knew what the problems were. I also had some solutions to the problems. This fact was acknowledged and never ignored. In fact, the methodology I selected was partly to ensure that my involvement did not distort the gathering or analysis of knowledge. Use of triangulation, sharing results during reflection meetings, systematic planning and reflection and use of different informants reduced the bias and guaranteed the trustworthiness and authenticity of the research process. I have also tried to be as transparent as possible when describing the choices and decisions that were made during each action research cycle.

When evaluating the quality of action research, different scholars have different criteria. I have chosen the criteria of Heikkinen, Huttunen and Syrjälä (2007): historical continuity, reflexivity, dialectics, workability and evocativeness. According to these criteria, I can claim that this action research project has been successful. Without reflexivity and dialectics the teachers' change process would not have been as smooth as it was. Reflexivity and dialectics were probably conditions of collaboration. In a project with concrete outcomes workability

seems to be an essential criterion. Workability is about relevance and it is evident that the findings are relevant. Mattsson and Kemmis (2007) call the workability criterion a relevance criterion and claim that a project is relevant if it contributes to particular types of competence or capacities among the participants. This was clearly seen in the project. Another quality criterion which I find useful is related to change. According to Mattsson and Kemmis (2007), the aim of praxis-related research is not merely to acquire new knowledge, but also to contribute to a change of praxis. If a project does not lead to change, the project is not successful. The action research project conducted in Maisha Primary School led to changes of teacher practices. The changes also seem to have been substantial ones.

8.2 Main findings

The findings of this research grew out of the practical process of trying to answer the primary research question: how can teachers change their teaching practices and facilitate learning of children with visual impairment enrolled in regular school? The findings in action research projects reflect both research discovery and practice discovery (Zuber-Skerritt, 1992). In this section I discuss the main findings; competence and capability, collaboration, knowledge and skills, attitudes, reflection and teaching resources.

8.2.1 Competence and capability

Teachers were engaged in collecting data about their own teaching practices in many different ways; they were participating in interviews and group discussions, listening to fellow teachers, interacting with the children and reflecting. The teachers converted tacit knowledge to explicit knowledge through reflection and actions in the classroom. The teachers were building competence and capability. Competence was gradually developing as they were engaged in creating learning communities, in pairs, teams or groups. Learning communities in the school created a conducive environment for discovering new knowledge. There was sharing and critical interrogation of their practices in an ongoing, reflective, collaborative, inclusive, and learning-oriented way (cf. Stoll, Bolam, Mcmahon, Wallace & Thomas, 2006).

Teachers were building capability as they were creating challenging situations, answering the question about ‘how to’. In answering such questions the teachers were involved in planning, action, observation, and reflection, through which they were developing capabilities. They were making sense of the school reality with the aim of changing the reality through collaborative problem-solving. On the other hand the teachers were also developing personally through the new experiences, which formed the foundations for an ethical and effective inclusive education teacher profession.

The teachers also developed self-awareness, for example when they thought that children with VI would understand if they made tactile regular letters. Soon, they realized that did not work. They became aware of the need to solve the challenge in some other way so they started collaborating with teachers with VI to prepare Braille text. As an outcome of this study the teachers developed self-knowledge and self-reflection (cf. Tragoulia & Strogilos, 2013). In this study teachers reflected on their practice as subject teachers and analysed their strengths and weaknesses, which were shared in the reflection meetings (cf. Webb, Vulliamy, Sarja, Hämäläinen & Poikonen, 2009).

8.2.2 Collaboration

As described in section 7.1.5 teachers were not sharing information from the beginning. During the project implementation the teachers started sharing knowledge and expertise through collaboration (chapters 7.1.3 -7.1.4). This was an innovation in this study which created opportunities for learning. The collaboration was later extended to the children, making children learn from the teacher and the teachers learn from the children. The collaboration among teachers was created after some of the teachers had learnt that children with VI need Braille print. This was a starting point for collaboration among sighted teachers and the teachers with VI. In this sense the researcher, the teachers and the children were learning together (cf. Hord, 2004; Jackson & Little, 2002; Naukkarinen, 2000; Temperley, 2007; Wood, 2007). In this way teacher involvement in action research resulted into creating a professional learning community (cf. Stoll, Bolam, Mcmahon, Wallace & Thomas, 2006). This change was a result of teachers working together in formulating a goal and later implementing with a focus of sharing experiences. Collaboration enables ordinary people to address problems which they have in common (Hammond, 2013). According to Mumba (2005) action research has the ability to form groups that can collaboratively implement aspects in inclusive education. Collaboration is an important aspect in professional learning communities. The main focus in the collaboration was to support the children with VI in accessing the general school curriculum. The fact that the teachers together identified practices and challenges, formulated problems to address, planned actions, collected data, implemented the actions, analysed and reflected upon the results led to increased collaboration between the teachers.

The knowledge generated through collaboration is collective and based on agreements. This was also the case in this study. The collaboratively created knowledge arose from the reflection meetings, where new ideas were expressed, discussed and planned on how to be implemented. This action research project sought to bring together action, reflection, theory and practice in the collaborative pursuit of practical solutions to issues of pressing concern to the teachers involved in the project and more generally to school and community development (cf. Kemmis & McTaggart, 1988; McNiff & Whitehead, 2006; Reason & Bradbury, 2006; Stoll, et al., 2006). The study revealed that the

teachers had shifted from the idea of teaching nearly homogeneous classes to classes with learners with diverse learning needs. The challenges identified in the beginning of the project were addressed and solved. The main challenge identified by the teachers was lesson presentation without proper teaching and learning materials. The teachers' concerns emanated from their inability to improvise tactile teaching materials such as Braille printed texts which could support the learning of children with VI. Through collaboration the teachers managed to address the identified challenges regarding teaching materials. This can be seen as an important finding, as learning materials like books play a vital role in enhancing children's learning. It can be concluded that it is possible for teachers with no formal training in special education to produce material that can promote the learning of children with disabilities included in regular classes. However, collaboration between teachers seemed to be a crucial factor in this study.

8.2.3 Knowledge and skills

The findings in this study have indicated that with the use of action research there are possibilities of developing knowledge and skills on including children with disabilities in a regular classroom without the need of having formal training in special needs education. Often the lack of formal training in special education has been regarded as an obstacle for inclusion in the country (Kapinga, 2012; Mmbaga, 2002). The action research project reported in this study was a kind of school-based professional development program. However, it was a program with a research aim. The teachers in the study learned new skills through the project activities that helped them to meet the learning needs of the visually impaired children who were included in their classes. Several researchers (Angelides, Georgiou, Kyriakoua, 2008; Argyropoulos & Stamouli, 2006; Makoelle, 2012; Mills, 2003; Mumba, 2005; Ruthven, 2005) have shown that teachers can learn new skills when they participate in action research. It must be emphasized that any change that is sustainable, relevant and effective is achieved in a context where the participants have time to research their practices, create interventions, reflect and modify interventions based on informed decisions in an environment where there is a supportive culture. In this study the school developed a supportive culture as the teachers were encouraged to express their needs and the challenges they faced. The most important arena for this was the reflection meetings, where the challenges were discussed and evaluation of practices and decisions was made. These meetings had an impact on the teachers' professional development. The teachers could also get direct feedback as they tried new practices in their classrooms and saw the effects on the children's learning. The children's success acted as reinforcement for the teachers as they realized that they managed without formal training in special education (cf. Eraut, 2004; Roettger, 2006).

8.2.4 Attitudes

When this study started the regular teachers in the school were not conscious of the learning needs of the children with VI. The two teachers in the school with formal training in special education were not supporting the regular teachers, at least not on a regular basis. How to include the visually impaired learners in the teaching and learning process was not a topic that was discussed among the teachers. The attitudes of the teachers were sometimes negative. Upon completion of the project many of the participating teachers had changed their attitudes and had developed skills in supporting children with VI included in their classes. According to Rouse (2007), implementation of effective inclusion practices depends not only on increased knowledge but also on attitudes. It is important to encourage practitioners, in this case teachers, to do things differently and to give them possibilities to reconsider their attitudes and beliefs (Loreman, Forlin & Sharma, 2007). This was also shown in this study. When the teachers started to reflect and to solve challenges together they tended to change their attitudes. Many of the teachers thought that children with VI could not learn, but when they changed their practices and saw the effects on the children's learning outcomes, their opinions changed. In this study therefore teachers changed their mind-set from 'I cannot do' to 'I can do' by trying out different strategies and starting to include children with VI in their teaching and learning process. As the study proceeded teachers became more positive to supporting children with VI in their learning.

The change of individual teacher attitudes can lead to school development. Teachers are the key actors in school development. Many researchers, for example Mourshed et al. (2010), Weindling (2006), Timperley (2008) and Kiely et al. (2010) put emphasis on the teacher as the critical element in school development. The findings of this study support the idea that a change of attitudes towards people with disabilities requires information about disabilities as well as experience with people with disabilities. Such experiences can only be obtained when all share the same learning environment (Carroll et al., 2003; Cook et al., 2000; Naukkarinen, 2000; Westwood & Graham 2003; Wood, 2007). However, sharing of the same learning environment does not seem to be enough. Before the action research project started in Maisha Primary School the sighted children and the children with VI shared the same learning environment (from class IV). Despite this the attitudes were not always positive. In order to produce systematic changes the teachers needed to collaboratively engage in systematic inquiries about their existing practices. Studies indicate that attitudes can change in social contexts where relations are emphasized (Makoelle, 2014; Savolainen, Engelbrecht, Nel & Malinen, 2012). The school context is seen as influential in implementing inclusive education (cf. Albarracin, Jonson & Zanna, 2005; Loreman & Earle, 2007; Walker, 2012). As the project continued, the teachers realized that they can modify existing learning resources and prepare teaching resources that are accommodative of all children included in their classes using locally available resources with no added cost implications.

Of the factors influencing inclusive education, the attitude factor seems to override other factors because of its importance in influencing teachers' actions toward change of practices (Steyn, 2005). Action research encourages teachers to study their own classroom practices and thus elicits change in the classroom (Guskey, 2002; Mertler, 2006; Mills, 2011). Changes in attitudes affect the implementation of professional development experiences in a positive direction (Guskey, 2000). This was also seen in this project. On the whole, changes in teachers' attitudes made a contribution to successful implementation of the action research project.

8.2.5 Reflection

In this action research project the participating teachers learned to reflect upon their practices. The reflection meetings proved to be effective as teachers shared their experiences, findings, concerns, problems and understanding of the school practices and challenges. It was in the reflection meetings where the teachers decided ways and strategies to address challenges after thorough evaluation of what existed in the school. In the reflection meetings the teachers discussed their findings and agreed on actions to take after analysing the results from the previous actions. The meetings created a culture of reflectivity that facilitated the individual teachers' development of new knowledge and skills. During the implementation of action research, those involved must have time to share ideas (Andersen & Siim, 2004; Anderson, 2005; Ferrance, 2000; Johnson, 2012; Levin, 1995). In action research action-reflection-action forms a spiraling action toward improving practices (Carr & Kemmis, 1986) and learning new ways of acting on a problematic situation. Teacher actions resulted from knowledge created during reflection meeting.

The reflection in the meetings had an element of empowerment. According to Freire (1974), empowerment is the ability to understand social, political and financial contradictions and can lead to an ability to act against the oppressive influences of real life. Empowerment during reflection was enhanced through individual reflection (through writing), group discussions, presentation of group results and whole group discussion and sharing (cf. Radermacher & Sonn, 2007; Whitmore, 1994). Other scholars view empowerment as a process through which social groups improve their ability to create, manage and control material, social, cultural, and symbolic resources; in other words, to give social groups the power to decide about their own lives (Andersen & Siim, 2004; Levin, 1995; Anderson, 2005). In this study the teachers were empowered as they grew professionally and learned new things. They found out that change is possible even though the resources are scarce. Also the children were empowered as a result of the project. They were given possibilities to learn better, they felt more included, more competent and more able to control their own learning. Empowerment is about control and courage to change, to act and to make decisions about important topics. The teachers in this study had the courage to change their own practices. They also understood that inclusive education is something other than

physical placement and that there is no contradiction between inclusive education and support.

8.2.6 Teaching resources

Lack of teaching resources is the main challenge in most schools in low-income countries. This is the case also in Tanzania. In this study the teachers increased the availability of tactile teaching materials for the purpose of increasing participation of children with VI in the teaching and learning process. The prepared teaching materials turned out to be useful for all children, including the sighted ones. The sighted children benefited as they supported the teachers in collecting local material, preparing the material, and as they supported children with VI during the teaching and learning process. If the children with VI needed an illustration or a text in Braille the sighted children supported the teachers in producing it. The preparation of tactile teaching materials led to increased preparation and use of concrete materials for all children. The teachers started making materials which had both normal print and Braille print. Thus, all children could benefit from the material and the teachers realized that many sighted children also learn better when they have concrete materials. This understanding might have contributed to the positive attitudes of the teachers as they came to realize that the project outcomes benefitted all pupils, not only a minority of pupils with VI.

Although this project did not increase the availability of textbooks for children with VI, the prepared tactile teaching material was a step toward making existing learning materials available for learners with special needs. In Tanzania most of the curricular materials, including textbooks, do not cater for children with special needs and do not consider the knowledge and skills of the teaching force (Heneveld & Craig, 1996; Lockheed & Verspoor, 1991; Sumra, 2004). On the whole, this action research project has contributed to increased teacher knowledge about inclusive education and the insight that it is possible to prepare low budget teaching materials that can be used with all children. The teachers realized that strategies that help children with special needs and disabilities to learn promote the learning of all children.

To sum up, the main findings show that teachers can change their teaching practices and facilitate the learning of children with VI enrolled in regular schools. When teachers get the chance to analyse their practices, actively seek solutions to the challenges they face, plan actions and reflect on actions, then change is possible. In this project the teachers learned to work in a new way through collaborative reflection and action.

8.3 Contribution of the study

This study has made a contribution to teacher professional development in Tanzania, to the special education research in the country, to education policies and to the research community more generally. The findings from this study have contributed to improving professional development practices within implementation of inclusive education in general and in particular in schools facing challenges of resources, especially, in developing countries. Emphasis in professional development through use of action research is on creating opportunities for creating professional learning communities in which teachers create a dialogic space where they can discuss their concerns and critique their current practices with a focus on changing their practices. This study has indicated that professional development has greater impact when it is done in situ using action research approaches (cf. Bleicher, 2014; Darling-Hammond, 2011; Timperley, 2008). Schools, apart from being a working environments have to be transformed to learning environments in order to study how school community members have formed and shaped reality socially, culturally, discursively, politically, materially and economically. If teachers understand this they will be in position to create opportunities for all and to use Mattssons and Kemmis' (2007) words, to create solidarity and democracy. After all, inclusion is about solidarity, democracy and human rights.

Special and inclusive education in Tanzania faces many challenges related to practical problems. This study therefore forms a basis of using action research as a means of developing inclusive education in Tanzania. Taken this context into account the study brings new views on how to address inclusive education challenges in Tanzania. This study is an example of collaborative action research where school stakeholders, primarily the teachers developed knowledge about inclusive practices and addressed challenges related to practical challenges. The study has the character of pragmatic action research (cf. Hammond, 2013), as the starting point was to find solutions to problems, which in most cases were related to lack of knowledge, skills and resources.

To the research community certain elements of this research may have general applications to other situations that focus on change. The approach and broad method, if adapted to the specific needs, situations and contexts of other systems, may be of more value than straightforward application of the findings. The extent to which findings can be generalized into other contexts will not only vary with similarities of the context and limitations of the research, but also with the manner and style in which they are applied. In the case of the action research community these findings indicate that stakeholders have their conceived meaning about the context that has been developed over time. In such a case entering their territory require careful planning and ensuring they are

empowered to study their reality and discover what needs to be changed, challenged or adapted. The initial researcher idea is fluid and shaped by the context in which the idea is implemented. This action research study can also contribute to other studies dealing with educational change, systemic learning, collaboration, professional development and inclusive education. The literature search on action research projects in Tanzania revealed no other published work in the field of education where teachers took the active role of changing their school practices in a school enrolling children with VI. Future researchers who plan projects in a similar context might be able to learn from the experiences gained in this action research project.

8.4 Implications of the study

Using action research can be a solution to teacher challenges in Tanzania and beyond as teachers change their teaching practices and facilitate the teaching and learning process in classrooms with a diversity of learners. In many developing countries a number of policies and practices are introduced in schools by education authorities without teachers being oriented towards them. This was also the case with the introduction of inclusive education in Tanzania. The teachers were supposed to implement inclusive education without in-service training courses, without curriculum support from TIE (Tanzania Institute of Education) and without support from local education authorities. In a situation like this it was impossible to implement inclusive education in those regular schools that enrolled pupils with disabilities. In most cases the pupils were placed in regular classrooms without any support.

The findings of this study indicate that plans for school-based professional development programs for teachers need to be put in place so that teachers are given opportunities to change their teaching practices and to include all learners in the teaching and learning process. However, SBPD programs are not enough. Also colleges and universities need to include more content on special and inclusive education in their teacher education programs. Since 2005 primary school teacher education programs have a small component of inclusive education. However, one of the challenges is that teacher educators and tutors do not have the knowledge and skills to teach topics related to inclusive education. There are very few teacher educators who have higher academic degrees in special education.

The centralized curriculum and the rigid examination system in Tanzania pose challenges for the implementation of inclusive education. Without formal possibilities of educational adaptations and individual education plans it is not easy for the teachers to know how to cover the syllabus for all the pupils in their classrooms. Collaboration between professionals is an important aspect in developing inclusive education practices. However, there is no culture of collaboration in Tanzanian schools. Teachers are not used to sharing knowledge and experiences. The school culture is individualistic. However, the findings of

this study indicate that collaboration is possible. In this study the teachers discovered that they had a shared need and engaged in identifying problems, proposing solutions, implementing plans and evaluating outcomes (cf. Friend & Bursuck, 1996). The teachers worked as a problem-solving team of professionals, together with me as a researcher. The findings of this study have indicated that professionals, if given a chance to collaborate, can contribute to the implementation of inclusive education in schools. According to Walker (2012), professional development that involves active participation in workshops, teaming, cooperative learning, team-building collaboration, and peer coaching skills have greater impact in changing teacher practices. There is a need also to make use of special education teachers to support regular teachers in implementing inclusive education. The special education teachers can give guidance and consultation in special education matters to regular teachers.

In Tanzania, like in other countries, educational policies are guided by and respond to international agreements including Education for All (EFA), Millennium development goals (MDG) and attempts to initiate system wide changes. According to Croft (2010) MDGs cannot be achieved without the inclusion of children with disabilities and young people in education. There are many children who never enter school, others who start but make poor progress and drop and there are those who stay in school without support from teachers (Croft, 2010; Mmbaga, 2002). School failure because of disability or special needs is linked to poverty (DFID, 2000). As long as the population grows rapidly the disability rate is not decreasing and the teachers will continue to face challenges in meeting the learning needs of children with special needs included in their classes. This study has shown the potential of action research in supporting teachers in meeting challenging teaching and learning situations. The study has shown further that exclusion is not only a reality for children with disabilities but also for teachers with disabilities (teachers with visual impairment). In this view educational policies giving more power to schools are likely to support schools in implementing inclusive education through collaboration and school based-decisions (cf. Honig & Rainey, 2012; Honig & Venkateswaran, 2012; Pedzisai, Tsevere & Nkhonde, 2014).

8.5 Limitations of the study

In this action research study 14 teachers and 6 children with VI from one school participated in the implementation of the actual action research project (Phase III). In this respect, the study is a case study of one school. The selection of the teachers and the children was purposive, as I chose pupils with VI from class 4 and class 6 and their teachers to participate in the study. This can be regarded as a limitation of the study, as it is impossible to suggest that the results obtained in this action research project can be generalized to other schools and teachers. However, the study was conducted in a primary school which is representative of rural primary schools in Tanzania. The findings of the study can thus be

informative when joined and compared with other case studies and common features and differences explored (Eisner, 2005). Thus, there is a possibility to generalize the findings from this study to other similar contexts.

There is a challenge and a dilemma in sustaining the changed practices after the ending of the action research study. It is not possible to say what will happen when the support provided during the project implementation ends. However, the participating teachers changed their teaching practices in their classes. The teachers developed knowledge, skills and orientation in supporting children with VI. As the project outcomes were successful, it is possible that the teachers will continue to implement what they developed during the action research process. However, there is a need to develop mechanisms that would ensure the sustainability of action research projects focusing on the empowerment of teachers. Support from government, local education authorities and school leaders are probably important for the sustainability of school-based professional development projects.

8.6 Concluding remarks and suggestions for further research

The findings obtained in this study suggest that teacher empowerment through school based professional development using collaborative action research approaches has sound results in creating a teaching environment that encourages the learning of all children in inclusive classroom. The empirical results provide a platform for exploring the usefulness of action research in improving teaching and learning processes. The findings are firstly expected to create awareness among educational stakeholders of the existence of children with disabilities who are included in regular classes and do not benefit from regular curriculum instructions. Secondly, the study has shown the need for and usefulness of action research as a form of school-based professional development aiming at changing teachers' practices and eliminate barriers to learning. The study has shown that change is possible.

Thirdly, teachers and other education professionals can use action research in improving the quality of teaching by establishing collaboration networks in order to increase the availability of books, learning materials, assistive devices and other resources. In most low-income countries the home environment has no financial resources for buying material and assistive technologies. Children with disabilities and their parents depend on the availability of resources in schools. Provided children with disabilities do not have opportunities at home, schools should become the place where children can learn skills that will help them to have a good quality of life. Fourth, the study has shown that teachers can manage to change their teaching practices and become facilitators of learning in classes enrolling children with disabilities. Teachers are at the core of school development. School development fosters inclusion. Where there is exclusion in

education there is a fertile ground for poverty and marginalization, which results in social, economic and cultural inequalities.

Furthermore, the research findings suggest the need for further case studies using school-based professional development approaches: action research or other types of approaches where the study of practice and development of practice is central. Partnerships with universities and schools could be initiated as this study and also previous studies have reported promising results. Although the findings from such case studies cannot be generalized, the systematically documented procedures can be used in planning and conducting action research in other areas of study that seek improvement and change of practices. Another aspect of concern that could be further explored is the role of school leadership in facilitating inclusive education. In this study the head of the school was also an active participant as he was one of the science teachers in the school and also an itinerant teacher. Head of school played a triple role as a school decision-maker, the head of school, and as a research participant. There is a need to involve all school leaders at district or council level in monitoring programs aiming at school development. In Tanzania there is a centralized education administration which means that certain decisions regarding inclusive education cannot be taken at school level. When it comes to enrolling children with disabilities, the head teachers are influential. Therefore, a study of school leadership and inclusion would be of crucial importance especially if linked to effects of education policies in implementing school-based decisions.

8.7 Postscript

The action research project at Maisha Primary School was implemented in 2009. In February 2014 I visited the school in order to see if the teachers had continued using the teaching practices they had developed during the action research project. During the visit I interviewed the head of school, 5 teachers, and 4 children with VI. The head of school commented positively about the project, which had led to sustainable changes. The school had established a resource room and appointed a teacher responsible for tactile teaching materials. In the resource room there were a number of resources (see Appendix 6). Mselem, who was still head teacher, described the development.

> Since we started preparing tactile teaching materials teachers are using them in the teaching and learning process and a teacher has been appointed to oversee the preparation and use of tactile teaching materials. Also the number of teachers trained in special education has increased from 2 in the year 2009 to 6 teachers. The 4 who have been trained in special education participated in the action research project. The school last year (2013) was the best in a competition on the preparation and use of teaching resources using locally available materials. On the whole, participation in action research was of much benefit to the teachers and the children. [Mselem, February, 2014]

The head of school also revealed that the school was still doing well in the preparation of teaching resources using locally available resources. The number

of teachers trained in special education had increased and the school was becoming more inclusive. One of the teachers who participated in the action research project, Agnita, viewed that the action research project had increased motivation to learn more about special education. Agnita joined Patandi Teachers' College to be trained in special education.

> After participating in the action research, I was interested in knowing Braille skills and working with children with visual impairment. I decided to join Patandi teachers college. I am now teaching children with VI in the early years. At our school as in other schools children with VI are included in regular classes when in class 4. At the level of class 4 a child with VI has developed communication skills, Braille skills, listening skills and daily living skills that support the child in mainstream society. At our school already we have a special resource centre with appointed specialist teachers dealing with preparation of teaching resources. [Agnita, Interview, February 2014]

Apart from teachers, also the children had positive opinions on the use of tactile teaching materials and the way the school had changed into becoming more inclusive. Pasi, a child with VI in class six, said tactile teaching materials had supported him in participating in the whole teaching and learning process.

> I am in class six; I can explain to my fellow children using tactile teaching material. I can write essays using pictures like my fellow sighted children. I am happy because I can participate in the classroom like my fellow sighted children. In our school, in almost all areas that require pictorial illustration the teachers make them tactile for us to use. Explanations on different parts are written in Braille so that we can read. [Pasi, interview 2014]

On the whole, the project seemed to be sustainable as teachers continued using the skills they had gained for more than five years after they had participated in the action research project. During my visit only two teachers had been transferred. This indicates that if teachers are trained through school-based professional development and remain in the school for some period, they are likely to continue changing their practices. Factors leading to sustainability might be many, including continued collaborations formed and the friendships and partnerships created during implementation of the action research project.

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Appendices

Appendix 1. Teachers Action research project evaluation

My participation in the action research project has enabled me to (1= I totally disagree 2 = I disagree 3. I disagree to an extent 4. I am unsure 5. I agree to an extend 6. I agree 7. I totally agree):		Number of Respondents in each Likert Scale Item						
		1	2	3	4	5	6	7
1	Increase skills in discussing with other teachers about teaching of children with visual impairment						5	9
2	Increased collaboration with fellow teachers						5	9
3	Gain knowledge in needs identification for children with visual impairment						3	11
4	Elicit teaching and learning challenges for children with visual impairment	1	1				5	7
5	Increased collaborations/close relationship with children with visual impairment						4	10
6	Plan strategies to support children with visual impairment						6	8
7	Allow student participation in lesson evaluation					3	5	6
8	Change practices in order to support learning of children with visual impairment						7	7
9	Understand importance of research in reducing barriers to learning among children with visual impairment						5	9
10	Prepare tactile teaching and learning resources						2	12
11	Understand that children with visual impairment can learn and achieve like sighted children						5	9
12	Use of resources in classes including needing more time	3	3				4	4
13	Not all learning resources can be improvised by teachers					4	8	2
14	Children with visual impairment enjoy a lesson when teacher uses learning resources in their lesson presentation						3	11
15	Tactile teaching resources involve all children in classroom activities		2			2		10
16	When preparing a teaching resource you have to consider more children with visual impairment included in your class						3	11
17	Build creativity that makes lesson presentation easier						5	9
18	Use tactile learning resources in the classroom						5	9
19	Develop collaborations with teachers with visual impairment						4	10
20	Understand importance of action research in developing teaching						3	11

Appendix 2. Individual Teacher on the action research project

Name	The teacher views on the implemented action research project
Agnita	• Increased collaboration with sighted and teachers with VI. Increased knowledge in special and inclusive education • Collaborated with Amos to prepare Braille text • Collaborated with children to prepare TTM • I learnt how to support children with VI and reduce barriers in their learning • I learnt what is good for children with VI is good for all • I learnt that teaching materials supported teachers in changing teaching strategies • I was motivated to teach a class including children with VI
Amos *	• I learnt research skills • I developed interviewing skills • I prepared TTM for example I prepared Organizational Chart with Mercy • I changed from regular teacher to teacher teaching in an inclusive class • I managed to use co-teaching • I managed to use maps in my teaching
Antonia	• Prepared Tactile materials • Collaborated with Teachers with VI in developing Braille texts • I learnt how to support children with VI and reduce barriers in their learning • I learnt to prepare and use TTM • I am encouraged to take a course in special Education
Baraka *	• Prepared Braille text • I learnt how to teach alphabet in inclusive class • I learnt how to prepare and use TTM • I changed from regular teacher to teacher teaching in an inclusive class • I managed to use co-teaching • I learnt what is good for children with VI is good for all
Benjamin	• I collaborated with teachers with VI to prepare Braille text • I with my colleagues assisted each other in understanding how to develop teaching materials and supporting children with VI in learning • I collaborated with children with VI in improvising different games for them • I managed to use co-teaching • With Mselem I got support in developing games for children with VI
Betty	• Collaborated with teachers and children in creating TTM by using the locally materials for other subjects • I taught sighted children skills in preparing and using TTM • I learnt what is good for children with VI is good for all • I increased motivation to teach a class including children with VI • I changed from regular teacher to teacher teaching in an inclusive class • Collaboration with children with VI increased

Name	The teacher views on the implemented action research project
Boni	• I collaborated with teachers to prepare TTM • I learnt that children with VI can read Braille print. • Increased interest in teaching children with VI • I increased class management skills • I managed to use co-teaching
Clara	• I collaborated with teachers with VI in preparing and using TTM • I learnt what is good for children with VI is good for all • I learnt that teaching materials supported teachers in changing teaching strategies • I increased choice of teaching techniques • I developed knowledge in teaching children with VI
Edina	• I collaborated with teachers with VI in preparing and using TTM • I learnt different teaching strategies • Increased choice of teaching styles as I was now able to involve children with VI included in my class
Esta	• Braille text, tactile teaching materials • I developed knowledge and skills in preparing and using TTM • I changed from regular teacher to teacher teaching in an inclusive class • I learnt what is good for children with VI is good for all • I with my colleagues assisted each other in understanding how to develop teaching materials and supporting children with VI in learning • Inclusive education is good as it makes all children participate in teaching and learning process • I learnt how to support children with VI and reduce barriers in their learning
Herena	• Collaborated with teachers with VI to prepare Braille print English reading text • Collaboration with children with VI increased • I managed to use co-teaching • I with my colleagues assisted each other in understanding how to develop teaching materials and supporting children with VI in learning
Mercy **	• Organizational Chart • Collaboration with children with VI increased • I learnt how to identify children learning needs • I learnt that children with VI can learn using TTM • I changed from regular teacher to teacher teaching in an inclusive class • Increased skills to teach children with visual impairment • I learnt how to support children with VI and reduce barriers in their learning • I learnt some research skills • I managed to use co-teaching

Name	The teacher views on the implemented action research project
Mselem**	• Collaborated with teachers in preparing TTM • With teachers decided to set a room in the school for preparing and storing TTM. This is a resource room • I appointed a teacher responsible for overseeing the development and use of TTM in the school • I learnt that teaching materials supported teachers in changing teaching strategies • I learnt what is good for children with VI is good for all • I with my colleagues assisted each other in understanding how to develop teaching materials and supporting children with VI in learning
Msigalila	• Increased knowledge in preparing and using TTM • I learnt that teaching materials supported teachers in changing teaching strategies • I with my colleagues assisted each other in understanding how to develop teaching materials and supporting children with VI in learning • I changed from regular teacher to teacher teaching in an inclusive class • I managed to use co-teaching • My collaboration with my fellow teachers increased • I learnt different teaching strategies for children with VI • I was motivated to teach children with VI using TTM • I learnt what is good for children with VI is good for all • I learnt how to support children with VI and reduce barriers in their learning

Source: Field data September 2009

Appendix 3. Phase I Data Collection Tools

3.1 Questionnaire for Teachers

This questionnaire is meant for this research only. The information provided in this questionnaire will be used for this research purpose and not otherwise. You are not required to write your name. This questionnaire seeks information about your experiences in teaching children with VI included in regular classes.

SECTION ONE

1. Sex: Male ……. Female …….. (Please tick one)
2. Your age ……. Your teaching experience (years) ……
3. Your Education level: (a). Form IV …… (b). Form VI …….. (Please tick one)
4. Highest Teacher Education qualification (a). Certificate …. (b). Diploma…3. Degree (Please Tick one)
5. Attended special education Training (a). Certificate … (b). Diploma……. (Tick one)
6. On average you are teaching a class of how many children ……
7. Your experience in teaching a regular school i. [0-1]ii. [2-5].iii.[6-10].iv. [Over 10 years] (Please put a tick
8. Do you teach classes that include children with disabilities? 1. Yes 2. No (Cycle one)

If yes fill in the following Table

Class	Type of Disability	Number of Children

Your experience in teaching a class including children with disabilities (Put a tick)

i. Less than 1 year……...
ii. One year …….
iii. 1-3…..….
iv. 2-5 ……..
v. 6-10 ……..
vi. Over 10 years ……

SECTION 2

1. Do you have knowledge in assessment skills? …….

2. Do you have knowledge in teaching Children with VI? ……..
3. What are the problems you are facing in classes including Children with VI? ……..…….
   ……
   ……
4. What are the problems you are facing when teaching sighted children?
   ……
   ……
   ……..……..
5. What strategies do you use in teaching children with VI included in regular classes? …….…….
   ……
   ……
6. Describe teachers' work in classes including Children with VI
   ……..……
   ……
   ……
7. What are the facilities available in your class including children with VI? ……..…….
   ……
   ……
8. Given a chance to suggest ways of improving teaching in classes including VI-children, what would you suggest?
   ……
   ……
   ……
9. What are you views on including children with VI in regular schools?
   ……..……
   ……
   ……..……

Appendix 4. Phase two data collection tools

4.1 A questionnaire for teachers

This questionnaire has been prepared to collect data or basic information that can be used in improving the teaching of children with VI included in regular schools. The information you provide will be treated confidentially. My assumption is that every individual has a different opinion about including VI-child in regular schools. You are not allowed to write your name in this questionnaire.

A. Background Information

1. Your age …… The year you started teaching …… Average number of children per class: …… Classes or Grades you are teaching ……..

2. Your level of Education (1) Form VI (2) Form VI (Circle one)

3. Your level of teacher education (1) Certificate (2) Diploma (3) Degree

4. Have you been trained in special education? 1. Yes 2. No (circle one) If yes, explain the type of training you received and the duration

……
……

B. Educating children with VI included in regular classes

5. Do you have children with disabilities included in your class? 1. Yes 2. No (circle one). If yes, mention the type of disability, how many, and the class

Class	Type of Disability	Number of Children

6. The year you started teaching children with VI included in regular class ……

7. Do all children in your class have a chair and a desk? 1. Yes 2. No (circle one)

8. Do children with VI included in your class have a desk and a chair? 1. Yes 2. No (circle one)

9. Mention types of assistive devices available in your school that support children with disabilities included in your class ……..
……
……..

C. Teachers Work

1. List the classroom activities in you engage children in a class with children with VI included …… ……
……

……
……..…….

2. List the classroom activities from which children with VI are excluded

……
……

3. What are the challenges you face when teaching a class including children with VI? ……
……
……

4. How do you overcome the challenge you face when teaching a class including children with VI? ……
……
……

5. What opportunities are available in the school for improving teaching and learning in your classroom? ……
……
……

6. As a teacher teaching in a school including children with VI, which type of placement options would you suggest for children with VI? Why?
…….. ……
……

7. Explain how you support children with VI included in your class.
……..……
……..…

8. Explain how children with VI included in a regular class learn.
……..……
……..……

9. As a teacher explain how you support children with VI in their learning.
……
……

4.2 Questionnaire for Children

1. Your Age …… Sex…… Class…….

2.Mention subjects you like most……

Explain why you like them …… ……
……..

3. Mention subjects you dislike most……

Explain why you dislike them …… ……
…… ……..…….

4. Explain how you are included or excluded in the teaching and learning process of different subjects in your class. …… …… …… ……

5. In your opinion, what should the teacher do to effectively include you in learning? …… …… …… ……

6. What type of assistive devices are available in the school that support you in your learning? …… …… …… …… ……..

7. What type of assistive devices do you need but are not available in the school for use? …….. …… …… …… ……

8. What are the challenges you face when included in the teaching and learning process in a regular school? …… …… …… …… ……

Mention your three best friends……,…… …..……..…….

When you are with your friends what do you normally do? .... …… …….....

4.3 Interview guide for parents of children with VI

1. How many children do you have? Of these, how many are children with disabilities?
2. What is your level of education?
3. What are the motives for enrolling your VI-child in a regular primary school?
4. How are the motives of sending your child to a regular school developed?
5. How can you support your VI-child when at home? When in school?
6. What are the expectations after your VI-child completes primary education?
7. What are the benefits you find as a result of your child being included in a regular classroom?

Appendix 5. Actual Study Data Collection Instruments

5.1 Cycle One

5.1.1 Interview guide for the head of school

1. What is your teaching experience?
2. Do you have any experience in teaching children with disabilities? Are you trained in special education? For how long?
3. What is your experience as a head in this school?
4. How many teachers do you have, and of these how many are trained in special education? How many are teachers with disabilities?
5. What is the status of buildings in the school, how many children, and of these how many are children with visual impairment?
6. What support services are available for children with visual impairment?
7. What is the school status in terms of the availability of teaching materials? How about teaching materials for visually impaired children?
8. Explain the challenges you are facing in including children with visual impairment in your school. How do you overcome these challenges? What are your suggestions for further improvement of the teaching practices in your school?

5.1.2 Questionnaire for teachers

This questionnaire is designed to elicit information on the inclusion of children with visual impairment in the teaching and learning process in regular schools. The information filled in will be treated as confidential and for the purpose of this study only. You are not required to write your name.

1. Year you started teaching ……
2. Year you started teaching children with disabilities: _____
3. You have taught children with what types of disabilities?
4. Do you have any training in special education: YES [ ], No [ ] if yes, where did you get it and for how long?
5. Before being transferred to this school, which school (s) have you taught in?……. Did the school (s) enroll children with disabilities?..... if yes, list the types of disabilities found in those schools. ……
6. How many children are in classes you currently teach? Fill in the Table below

Class	Boys	Girls	Total

7. How many children have different types of disabilities?

Type of disability	Class	Boys	Girls	Total

8. Which type of teaching methods do you use in your teaching?
9. What challenges are you facing in teaching an inclusive class?
10. Suggest ways to overcome the challenges you face in teaching an inclusive class.
11. How do you support children with disabilities included in your class during the teaching and learning process?

5.1.3 Pupils' questionnaire/ Interview

1. Age _____, Sex _____, Class/ Grade: _____,
2. What subject do you like most? Explain why?
3. What subject do you dislike most? Explain why?
4. Explain how the teacher involves you in the teaching and learning in each of the subjects you learn in this school.
5. What do you think the teacher should do so that you are involved in the teaching and learning process in each subject you learn in this school?
6. What learning resources do you have and use?
7. What learning resources do you need which you are not provided with?
8. What are the challenges you face in involving yourself in the teaching and learning process?
9. What do you suggest should be done to improve your involvement in the teaching and learning process?
10. Please mention three of your best friends. Where do you meet with your friends? When you meet, what do you normally do?

5.1.4 Interview Guide for teachers

1. How do you support children with VI enrolled in your class?
2. What are the problems and/or challenges you are facing in teaching a class enrolling children with VI?
3. What do you think should be done in order to improve teaching and learning in a class enrolling children with VI?
4. What teaching strategies are you using when teaching a class enrolling children VI?

5.2 Cycle Two

5.2.1 Head teacher interview guide

1. Have there been changes in your school as teachers participate in the action research project? Describe those changes.
2. In what areas do you find changes?
3. How are you supporting teachers in improving their practices?
4. Explain the progress and challenges you are facing in including children with visual impairment in your school as the school is participating in action research. How do you overcome these challenges? What are your suggestions for further improvement of the teaching practices in your school?

5.2.2 Teachers' interview guide

1. Upon understanding practices and challenges in your class and the improvement you have started taking: (a) If you were a child would you choose to belong in such a class? (b) If you were a child enrolled in the class you are teaching what would you have suggested to be improved? (c) Which activities would you have been sharing with VI-children included in your class?
2. During teaching an inclusive class, which criteria do you use to assess the achievement of your pupils?
3. Which changes do you feel can have immediate impact in your classroom?
4. Between last year and now what changes do you feel have happened in your classroom and in the school in general?
5. Which groups of stakeholders need to be included in order to make these changes sustainable?
6. Which changes do you think can improve the teaching and learning environment for children with visual impairment in an inclusive setting?

5.2.3 Children interview guide

1. What changes did you observe today in the classroom?
2. Were there changes made after classroom practices? Which are they?
3. Did the changes help you in learning? How? If not, what were the problems?
4. If you were given a chance to suggest improvements, what would they be?

5.3 Cycle three and four

5.3.1 Head teacher interview guide

1. Have there been changes in your school as teachers participate in the action research project? Describe those changes.
2. In what areas do you find changes?
3. How are you supporting teachers in improving their practices?
4. Explain the progress and challenges you are facing in including children with visual impairment in your school as the school is participating in action research. How do you overcome these challenges? What are your suggestions for further improvement of the teaching practices in your school?

5.3.1 Teachers interview guide

1. Which classes are you teaching? Which subjects are you teaching? How many children are sighted and how many are visually impaired?
2. What can you say was successful in using tactile teaching materials in your class?
3. As an experienced teacher are you finding any changes in your teaching as a result of participating in this project? Explain
4. Are there any changes you find in children with visual impairment as a result of changes you are making? Explain
5. What do you suggest be done in order to further improve the teaching and learning of children with VI included in regular classroom?
6. As a result of participating in this study, have you gained any knowledge and skills in supporting visually impaired children in your class? Describe them.
7. What are the limitations in this project? Suggest remedies
8. Explain what you have learned in this project and suggest what needs to be improved to make it more useful and interesting.

5.3.2 Interview guide for children with VI

1. Are there changes in the class? What are they?
2. Given chances to suggest further improvement, what would you suggest?

5.4 Cycle Five

5.4.1 Interview guide for the head of school

1. As the project is coming to an end, what are your general views on it?
2. What were the challenges in implementing this action research project in your school?
3. Have there been any successes you have experienced during the project implementation? Explain.
4. What are your suggestions for the project and its implementation in the school?
5. Do you have any suggestions for scaling up the project to other schools? If yes, explain them.

5.4.2 Questionnaire for teachers

This questionnaire is about your personal evaluation of the action research project you were involved in. The information will be treated as confidential and for the purpose of this study only. You are not required to write your name. I ask for your full participation in this evaluation exercise.

SECTION A

1. Sex: Female ---------- Male ……. (Tick appropriate answer)

2. Your age …….. Length of teaching experience ……..

3. Average number of children per class: … Classes or Grades you are teaching ……..

4. Your level of Education (1) Form VI (2) Form VI (Circle one)

5. Your level of teacher education (1) Certificate (2) Diploma 3. Degree (Circle one)

6. Have you been trained in special education? 1. Yes 2. No (circle one) If yes, explain the type of training you received and the duration and how

the skills supports you in facilitating teaching in a class in which child with VI is enrolled. …….. …… ……
……
……
……
……..……
……..

7. How many children have different types of disabilities?

Type of disability	Class	Boys	Girls	Total

8. Your experience in teaching a class including children with disabilities

(1) Less than 1 year…….. (2) One year …..… (3) 1-3…….…(4) 2-5 ……. (5) 6-10 …… (6) Over 10 years ……

9. Are ready to accept children with disabilities in your classroom? Explain
……
……
……
……
……
……

10. Have you attended short courses on professional development in inclusive education? Explain …. …… ……
……
……
……
……
……
……..…

11. Has participation in this action research project had any benefit for you? Describe …… …
……
……
…….

SECTION B

Put a tick (V) in the appropriate to rate yourself on the outcome as a result of your participation in this action research project. There are boxes ranging on a scale from 1 to 7. 1= I totally disagree 2 = I disagree 3. I disagree to an extent 4. I am unsure 5. I agree to an extend 6. I agree 7. I totally agree.

My participation in the action research project has enabled me to:		**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	Increase my skills in discussing with other teachers on teaching of children with visual impairment							
2	Increased collaboration with my fellow teachers							
3	Gain knowledge in needs identification for children with visual impairment							
4	Elicit teaching and learning challenges for children with visual impairment							
5	Increase collaborations/ close relationships with children with visual impairment							
6	Plan strategies to support children with visual impairment							
7	Allow student participation in lesson evaluation							
8	Change my teaching practices in order to support learning of children with visual impairment							
9	Understand the importance of research in reducing barriers to learning among children with visual impairment							
10	Prepare tactile teaching and learning resources							
11	Understand that children with visual impairment can learn and achieve like sighted children							
12	Use resources in classes including giving more time							
13	Understand that not all learning resources can be improvised by teachers							
14	Make children with visual impairment enjoy a lesson when I use learning resources in their lesson presentation							
15	Understand that tactile teaching resources involve all the children in classroom activities							
16	Know that when preparing a teaching resource I have to consider to a greater extent the children with visual impairment included in the class							
17	Build creativity that makes lesson presentation easier							
18	Use tactile learning resources in the classroom							
19	Develop collaboration with teachers with visual impairment							
20	Understand the importance of action research in developing teaching							

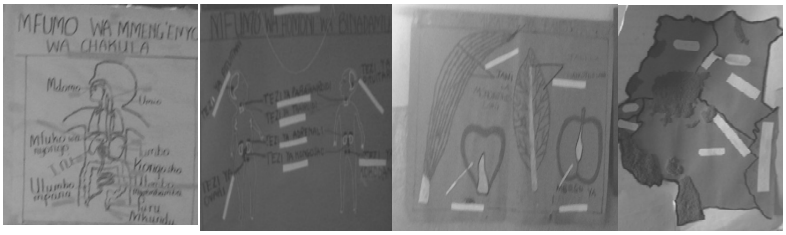
5.4.3 Interview guide for children with VI

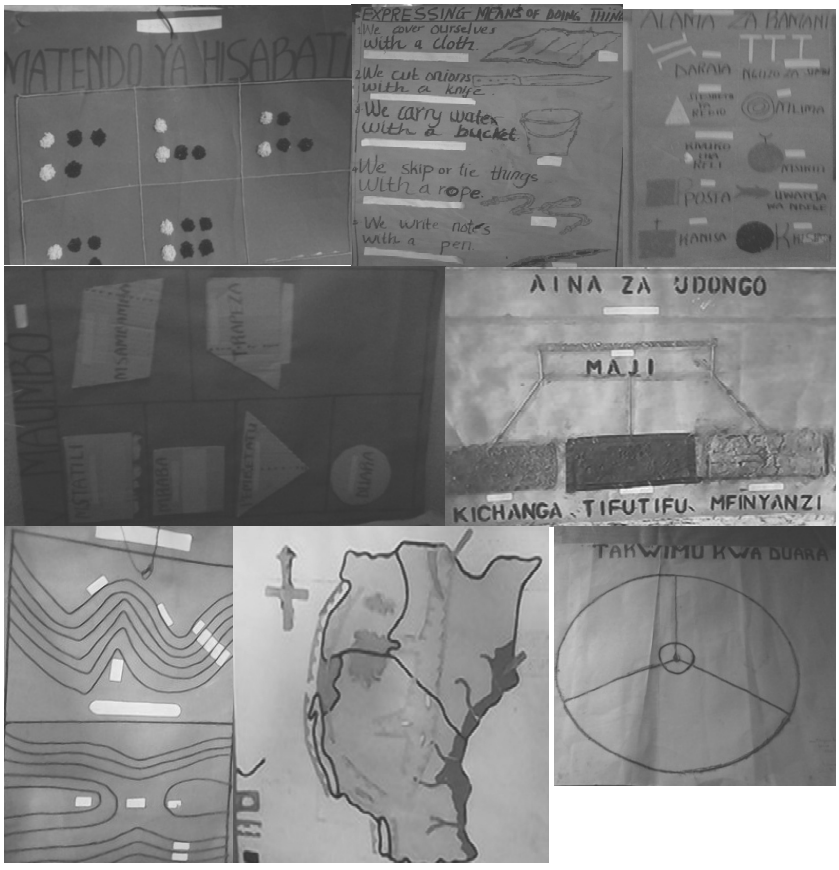
1. What interested you in the implementation of this project?
2. What did you dislike during implementation of the project?
3. Has the project supported in improving your learning and achievement in the school? Describe.
4. What were the problems you experienced during the project implementation?
5. If you were given a chance to decide on whether to stop or continue this project, what would say? Why?

Appendix 6. Observation checklist for cycles 2, 3, 4, and 5

1. How many times did a child with visual impairment answer a question?
2. How many times a child was with visual impaired asked a question?
3. Were the children given any teaching materials to use? What kind of resources and how frequently?
4. Who assisted the VI-child in using the teaching materials?
5. Did the desk used by VI-child have enough space to accommodate the teaching material? If not, how did the child use it?
6. Did the material have Braille print text?
7. What can you say about the quality of the teaching materials?
8. What were the teaching methods used?
9. How did the teacher involve VI-children in learning?
10. What support mechanisms were available in the classroom?
11. Where were the VI-children placed in the classroom?
12. Did the teacher use teaching material in the class? If used, how did the use of teaching materials affect the classroom climate? Was the time enough?

Appendix 7. Sample teaching materials at Maisha Primary School





Appendix 8. Research Permit

THE UNITED REPUBLIC OF TANZANIA

PRIME MINISTER`S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

SINGIDA REGION
TELEGRAPHIC: "REGCOM"
Phone Number: 2502075/2089/2249
Fax No. 2502078
E.mail:rcsgd@intafrica.com
In reply please quote:

REGIONAL COMMISSIONER'S OFFICE
P.O. BOX 5
SINGIDA

Ref. No. EDN 49 VI/II/90

29th January, 2009

Cosmas B.F. Mnyanyi,
The Open University of Tanzania,
Faculty of Education,
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DAR ES SALAAM.

UFS The Director of Regional Centre,
Open University of Tanzania,
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SINGIDA.

THE DIRECTOR
SINGIDA REGIONAL CENTRE
THE OPEN UNIVERSITY OF TANZANIA
P.O. BOX 617 TEL. 026-2502451
SINGIDA

Re: **A RESEARCH PERMIT FOR COSMAS B.F. MNYANYI**

Reference is made vide the above caption.

I offer you a permit to conduct a research on how teachers change their work and improve Learning environment of pupils with visual impairment accommodated in ordinary classes at Ikungi Primary School. Before you go to Ikungi, you have to consult The District Executive Director of Singida Rural as school owner.

I wish you all the best in your study.

Y. Kipengele
For: REGIONAL ADMINISTRATIVE SECRETARY
SINGIDA

AFISAELIMU WA MKOA
SINGIDA

C.C. District Executive Director
P.O. Box 236
SINGIDA

Cosmas B. F. Mnyanyi

Changing Teachers' Practices in Regular Schools Enrolling Children with Visual Impairment

An Action Research Project in Tanzania

Many children with visual impairment in Tanzania are lacking educational opportunities. The special schools for children with visual impairment are few and often far away from home. More and more regular schools are enrolling children with visual impairment, but the schools lack financial resources, tactile teaching materials and trained special education teachers.

This praxis-related study investigates how teachers in a regular primary school located in a poor rural region in Tanzania change their teaching practices as they participate in a collaborative action research project.

The results indicate that systematic analysis, reflection and collaboration enables regular primary school teachers without previous knowledge of special education to change their teaching practices and thus to facilitate the learning of the children with visual impairment.

The knowledge generated in this study can be relevant to the planning of school-based professional development programs and teacher education programs in Tanzania and in other low-income countries. The results also offer insights into the possibilities of including children with disabilities in regular schools.

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