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Professional Development

The experiences of primary school teachers in Tanzania

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Abstract

The overall aim of the study was to explore primary school teachers' experiences of constraints to their work, and actions taken for improvement after undergoing in-service courses in the Education Quality Improvement through Pedagogy program. The research interest was thus to deepen the understanding of teachers' experiences of constraints to their work and experiences of actions taken to improve classroom actions. In order to achieve this ambition, the study was conducted with primary school teachers in Shinyanga district-Tanzania.

Two research questions guided the study: What do teachers experience as constraints to their work? The second: How have teachers improved their classroom actions after undergoing professional development courses?
The theoretical framework of the study is centred on limiting and enabling frames on teachers' work and professional development. In order to understand the classroom situations, qualitative research was designed applying a phenomenological approach with semi-structured interview, observation and videotaping to collect data. Forty experienced primary school teachers from ten primary schools participated in the study.

The results of the first research question indicate that teachers face many constraints in their work. Three categories identified as interactional, environmental and professional role constraints. The most critical experienced by all teachers is teaching in large classes and inadequate teaching and learning materials. The results of the second research question show that teachers' actions taken for improving their work were influenced by professional development activities. Three main categories including expanded interaction, expanded use of environment and expanded professional roles were identified.

Generally, the knowledge generated is relevant for viewing teachers' experiences of the challenges they encounter in teaching and the importance of professional development beyond the sampled respondents. The results suggest that constant provision of teachers' professional development could improve teaching performance.

Keywords: professional development, teacher education, experience, phenomenology, reflection.

Abstrakt

Det övergripande syftet med studien var att undersöka klasslärares erfarenheter av omständigheter som upplevts begränsa arbetet och vidtagna åtgärder för att förbättra arbetet efter genomgånget fortbildningsprogram för pedagogisk kvalitetsutveckling. Forskningsintresset var således inriktat på att fördjupa förståelsen av lärares erfarenheter av hinder i arbetet och av deras erfarenheter av åtgärder som vidtagits för att utveckla undervisningen. Studien genomfördes bland grundskolelärare i Shinyanga-distriktet i Tanzania.

Analyzen utgick från följande två forskningsfrågor:
Vad upplever lärarna som hinder för sitt arbete?
Hur har lärarna förbättrat sin undervisning efter att ha genomgått fortbildningskurser?

Studiens teoretiska bakgrund är inriktad på ramfaktorer som begränsar och öppnar för möjligheter i lärares arbete och yrkesutveckling. Forskningen var kvalitativ med en fenomenologisk ansats och halv-strukturerade intervjuer, observationer och videofilmning användes för att samla in data. Fyrtio erfarna grundskolelärare från tio grundskolor deltog i studien. Svaren på den första forskningsfrågan tyder på att lärarna möter många hinder i sitt arbete. Kategorierna interaktion, miljö och yrkesroll identifierades som förklaringar på begränsningar i yrkesutövningen. De mest kritiska faktorer som lärarna identifierade var undervisningen i stora klasser och otillräckliga läromedel. Svaren på den andra forskningsfrågan visar att lärarnas åtgärder för att förbättra sitt arbete påverkades gynnsamt av fortbildningsaktiviteter. Tre huvudkategorier som inkluderade utvidgad interaktion, utökad användning av miljön och utvecklad yrkesroll identifierades.

Den kunskap som genererats är av generell betydelse för att synliggöra lärares utmaningar i undervisningen och för att visa på vikten av professionell utveckling. Resultaten tyder på att kontinuerlig professionell utveckling kan förbättra undervisningens kvalitet.

Nyckelord: professionell utveckling, lärarutbildning, erfarenhet, fenomenologi, reflektion.

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Vasa December 16th 2014

Mary Vincent Soko

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1 Introduction

1.1 Background, motives and aim of the study

The professional development of primary schools teachers in Tanzania is the main focus of the study. The preparation and development of adequate and competent primary school teachers, provision of better services and performance of teachers is highly challenged in Tanzania (Galabawa, 2001; Mosha, 2006). I investigate and discuss primary school teachers' experiences of teaching constraints and actions taken for improvement after they had undergone in-service education courses offered in education quality improvement through the Education Quality Improvement through Pedagogy-EQUIP program.

The academic qualifications needed for entering teacher education in Tanzania are low when compared to international standards (Towse, Kent, Osaki & Kirua, 2002). They are low in the sense that those who join teacher education for primary schools have just completed four years of junior secondary education and have graduated with the junior level secondary education certificate, which is commonly known as ordinary level secondary education certificate (see figure 1). Upon completion of a two year course in a training college they are awarded a grade 'A' teacher certificate (MoEC, 2009). According to Mosha (2006, 225), 'the candidates selected for the teaching profession, especially at the primary education level, are selected from mostly academically weak candidates'. Those with high passes usually join higher secondary education (advanced level) after two more years. In this respect, professional development programs for teachers can help orientate such teachers.

Data collected by the Southern African Consortium for Measuring Educational Quality in Tanzania in 2007 indicated around 80 percent of primary school learners[1] are being taught by grade 'A' teachers (with

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[1] In this study the terms learner, pupil and student are used synonymously.

lower level secondary education) and 16 percent by grade B/C teachers having a primary school certificate only (SACMEQ, 2010). According to the Education Training and Policy of 1995, teachers qualified for primary education level are those with Grade A certificate or above (URT, 1995). Despite the program for preparing teachers, Grade C was phased out in the 1980's and Grade B during the 1990's; thus, not all teachers were able to join the upgrading programs.

Data from Basic Education Statistics in Tanzania indicates that there are currently 6153 grade B/C teachers in primary schools who need to be developed at least to the level of grade 'A' (URT, 2012). Although the government conceives the teaching profession as a continuum with specific tasks to be accomplished in pre-service education and teachers' continuing professional development, the practice does not meet the realities in primary schools.

As in the sub-Saharan African countries, Tanzania has expanded its primary education because of the policy of universalisation by 2015 (United Nations International Children Education Fund- UNICEF, 2011). In addressing the problem of access and quality in primary schools, school fees were abolished in 2001 and in 2002 the Primary Education Development Plan (PEDP-1) was launched. The abolition of school fees tripled the number of learners enrolled. The change brought about a huge deficit of teachers and demand for more teachers in primary schools in Tanzania, and the government was urged to develop alternative routes for qualifying more teachers within a short period.

A two-tier teacher education program was introduced to meet the deficit of primary school teachers (Chediel, 2010). The government deliberately introduced this program with the ambition of educating as many teachers as possible to meet the gap of inadequate teachers in primary schools. The notion two-tier program can be defined differently depending on the needs. For instance, some defined the program as a sub-system of teacher education. This means ways in which teachers are prepared, qualified and developed through pre-service and in-service education (Chambulila, 2013). However, for the purpose of this study, a two-tier system is defined as a way of preparing pre-service teachers (for primary and

secondary education), in which two phases of equal period of time are employed. The details will be further dealt with in 2.2.1.

It is argued that teachers qualified during the two-tier program have been in great demand, academically and professionally (Mosha, 2006). Teacher qualifications have been so far strongly associated with graduated primary school teachers having limited knowledge and skills in teaching, indicating a great need for professional development. The questions to ask are: Why is professional development for primary school teachers a concern of the current study?

In Sub-Saharan Africa (SACMEQ, 2010) and specifically in Tanzania (Hardman, Abd-Kadir & Tibuhinda 2012) the quality of teachers and learners' educational outcomes has been compromised at the expense of quantity, hence poor learner achievement. Learners lack basic literacy skills to proceed into higher classes of education. This fact has become one of the most demanding agenda and discussion items for academics, politicians, non-governmental organisations and in social forums.

Based on the nature of preparing teachers through the two-tier program, the pre-service education is judged to be of *poor* quality (Hardman, et al., 2012). Those qualified to teach at primary education level have significant problems due to the unsatisfactory preparation they receive in college. Many teachers lack knowledge of the *subject matter* to teach and how to teach the subject matter successfully (*pedagogical knowledge and pedagogical content knowledge)*.These issues will be dealt with in more detail in Chapter 4.

Another reason for the poor quality of teachers is that they are educated by teacher educators who lack experience and expertise in primary education (Hardman, et al., 2012). In addition, teachers have a weak subject knowledge base and they fail to apply pedagogical content knowledge to the teaching and learning processes and rely almost entirely on textbooks.

The recruitment of unqualified and under-qualified teachers is claimed to address the teacher shortage, especially in rural areas in Zimbabwe

(Chikoko, 2006). This is despite the fact that the use of teachers with limited professional education has often been linked to low quality education and poor learner outcomes. It may not be surprising to find that poorly educated teachers produce poorly educated students. It is claimed that with many unqualified teachers being posted to understaffed rural schools; rural learners receive poor education. This can also be linked to a current educational research finding by Uwezo (2010), under the title 'Are our children learning?' Learners complete their primary education without acquiring basic literacy skills. Another study in Togo (Kruiger, 2010) found that learners taught by unqualified teachers performed worse than those who were taught by qualified teachers. These studies are supported by a study carried in Uganda with similar results.

In Tanzania for instance, teachers are prepared to inadequate programs and teaching and learning are dominated by rote-learning strategies (Tillya & Mafumiko, 2010). Ineffective qualification and professional development strategies for teachers, in primary education in particular, result in low quality of teaching. In response to what is considered to be inadequate professional development, several measures have been taken by the government and by non-governmental organisations. These include upgrading of grade B/C teachers by the government and empowering teachers through the EQUIP program by Oxfam (Hamilton, Ondit & Mnyasenga, 2010). For instance, from 2006 to 2011 the government has provided the upgrading courses to 41,383 grades B/C teachers (Mulkeen, 2005).

Different parts of the world face similar problems in their (primary) education, but the nature, type and magnitude of the problem vary. Because of the variations, Feiman-Nemser, (2001) claim that whatever the teacher education programs, teachers are never fully prepared for classroom realities. The pre-service program remains weak in relation to what teachers are experiencing in the classroom. Feiman-Nemser (2001) continues by claiming that professional development is disconnected and rarely tied to teachers' classroom work. Programs are not designed to promote classroom realities by teachers and learners. This argument informs how important professional development for teachers is, in order to improve their work.

Scholars have identified common problems facing teachers to include lack of professional courses, shortage of teachers, class size, inadequate training programs, low retention rates, under-qualification, inadequate funding, difficult working environment, lack of motivation and inadequate teaching and learning resources (Komba & Nkumbi, 2008; Villegas-Reimers, 2003; Darling-Hammond, 2005). There is a widespread concern about the low quality of teaching contributed to by a lack of professional development. As teachers lack the necessary competences needed for teaching, it affects their work and the learners' performance.

What are the experiences of the professional development program so far? Studies carried out on classroom practices in Tanzanian primary schools show teacher-dominated ways of teaching (Barret, 2007; Hardman, et al., 2012). The studies show that teacher-directed activities such as explaining, questions and answers, writing on the chalkboard, brief answers by individual learners or the whole class answering (chorus) and lesson summary take much of the lesson time.

For instance, a classroom observation study, comprising the subjects English, Kiswahili, mathematics and science by Hardman, et al., (2012) was conducted in Tanzania. A sample of 32 primary schools and 323 teachers, from grade 3 and 6, serving urban and rural contexts from 8 districts of the 25 regions in mainland Tanzania (Bagamoyo, Hai, Magu, Makete, Mtwara, Shinyanga, Siha, and Temeke) were selected. The results show that 74 percent of the class time was used by the teacher, leaving little time for other activities. This kind of practice discourages learners from participating in and taking responsibility for their learning. Very little guided learning seems to take place in the classrooms.

Based on the experiences and challenges mentioned in the preceding paragraphs, some Organisations like Oxfam Great Britain introduced an intervention program in Tanzania known as Education Quality Improvement through Pedagogy (EQUIP). The aim of introducing the EQUIP program was to improve the quality of the teachers' work in the classroom, as well as to improve the educational outcomes of the learners. In order to achieve its aim, concentration was put on the provision of subject matter knowledge, pedagogical knowledge and pedagogical

content knowledge (see 4.1.1 and 4.1.2) that will engage teachers vigorously in improving the quality of teaching and make learning meaningful.

1.2 Motives for the study

From the brief background and the choice of my research topic, the motivation for carrying out the study can be condensed in the following aspects: *need for research, system drawback, and personal interest.* However, these motives have been touched upon to some extent in the background.

My first motive is based on the current need for *research-based knowledge.* It is connected to the claim that related to the professional development of teachers in primary schools, the teaching constraints encountered and the actions for improvement after in-service courses in Tanzania are not coherently documented. There is a need for research that focuses on primary school teachers' experiences of their work.

There are a number of studies, however, on the professional development of teachers in Tanzania, which focus on management, learner-centred learning, quality education, and teachers' welfare. Previous studies on teacher experiences of their work have even addressed issues related to welfare, housing, salaries and motivation factors effecting teachers' work, (Komba & Nkumbi, 2008) but none of them concerns experiences of teaching constraints and changes in attitude brought about by in-service courses.

For example, the results of the Uwezo (2010) study show that some learners join secondary education without acquiring basic literacy skills. Learners complete the seven years of primary education with very little knowledge and few skills to support them in further education. From that point of view, there is a great and obvious need for knowledge base about the situation and the causes of poor results of learners in primary schools in Tanzania.

The current need for research-based knowledge on teacher constraints and actions for teaching improvement is important and will address questions such as: How do primary school teachers experience teaching in large classes? What kind of professional development do they need? How do the constraints affect teaching and learning? What experiences do teachers have after in-service courses?

The decision to carry out this study, investigating primary school teachers' experiences of their classroom work, is imperative, since it contains the potential to add value to the community and bridge the gap in knowledge and research in this area of professional development.

The second motive for the choice of my topic stems from a *system drawback.* Although the Ministry of Education, Vocational and Training launched the teacher in-service training strategy in 2011, its implementation has far to go (Hardman, et al., 2012). Unfortunately, the implementation is left to the individual teacher's organisation. This has been a challenge to teachers to organize themselves and join the program.

Another drawback is concerned with pre-service teachers' field teaching practice. In order to match the theoretical knowledge and skills acquired at the college, pre-service teachers are sent on teaching practice. Field teaching practice is performed for a period of 5 to 7 weeks conducted once in a year during the two year course. During this period the student teachers are given opportunities to teach the subject of their specialization as well as practicing other skills like management, being a class teacher and teacher on duty (Lukanga, 2012). Usually, teacher educators pay visits to assess the student teachers' performance.

The induction or mentoring program aiming at supporting and assisting pre-service and newly employed teachers also is not formally established in the education system (Bhalalusesa, Westbrook, & Lussier, 2011). Teachers do not get the proper support needed for professional development in their work probably for financial reasons. As a result, in some cases student teachers are left largely on their own to learn teaching survival skills. This has reduced the efficiency of the field teaching practice and the quality of teaching.

Non-governmental Organisations also implement programs on teacher development, but they are not coordinated. Since the programs are not coordinated, education providers tend to focus mainly on what they see as relevant issues according to their visions and missions (Lukanga, 2012). Their programs can therefore be seen as weaknesses, which may have contributed to the constraints teachers face in their work.

My third motive places the study at the core of the teaching action with focus on the problematic situation of teacher development in primary schools in Tanzania. This motive originates from *personal interest* and experience of teaching in primary schools for ten years, before joining teacher education for thirteen years. As a primary school teacher I have been involved in several education programs that have been conducted in order to raise the quality of teaching in primary schools. In fact, the programs have been beneficial not only to the teachers, but also to the learners' performance. I chose to work with primary school teachers in this research project because I find it meaningful to study a phenomenon which I have experienced and to some extent professionally developed.

For more than five years I was directly involved in the teacher development program of EQUIP from 2003 to 2008. The Tanzania Education Status Report of 2001 indicated that Shinyanga, the region where the project was conducted, is doing poorly on all education performance indicators (Galabawa & Ndibalema, 2005). To get the answers to the questions posed about teachers' understanding of teaching constraints and the meaning they take after the EQUIP courses also influenced my desire to do research in this field of professional development. Therefore, it became an impetus and inspiration for the study topic. My ambition of carrying out the study was to contribute to the generation of new knowledge, facilitating professional development with focus on the professional development of primary school teachers in Tanzania.

1.3 Aim and relevance of the study

Based on the background and the motives behind the selection of the topic, the aim is to deepen the understanding of teachers' experiences of their work through exploring the classroom teaching constraints and their actions taken for improvement after undergoing in-service courses in the EQUIP program. It is my expectation that the results of the study will provide a deep understanding of the constraints and their effects on learning outcomes.

Furthermore, the results might be useful to teacher training colleges in designing professional development programs within Tanzania, as well as for inspectors of schools when designing incentive schemes for teachers. The results can also be of use and of interest to the Ministry of Education, Vocational and Training since it provides information about the individual teacher's experience of teaching constraints and the developments made after in-service courses. Hopefully, it may enable the realization of an in-service teacher education and training strategy for primary school teachers in Tanzania, which was launched in 2011 as pointed out in the background. The strategy aims to provide systematic opportunities for teachers to improve their professional knowledge and competencies as stated into the Education Training Policy that *'the teacher is the most important actor in education and training. The teacher organizes and guide students in their learning and interaction with the content and the curriculum'* (URT, 1995 p.7).

1.4 Outline of the study

The study consists of seven chapters. Chapter 1 provides the general introduction, motives and the aim and relevance of the study. Chapter 2 presents an overview of the context of education in Tanzania. The chapter begins by describing teacher education in brief in sub-Saharan Africa, with emphasis put on the two-tier teacher education program in Tanzania, instructional materials and in-service training of teachers in brief. The work of the EQUIP program in Shinyanga district, as a case for the

importance of professional development, is discussed. Finally, a summary of the chapter is presented.

Chapter 3 is part of the theoretical framework, where limiting and enabling frames of teachers' work are discussed, such as class size focusing on large and small classes in relation to learning engagement, teaching methods on class size, instructional teaching materials with extensive discussion on textbooks. Some discussion on the school context as part of this chapter on teacher supply and demand, as well as learners' perspectives, drop-out, gender inequality and the impact of these on teaching and learning are highlighted. The chapter ends with discussion of parents' involvement in supporting their children and school development.

Chapter 4 covers the second part of the theoretical framework, and the aim is to examine the wider context of teacher preparation, development and its implications. The section looks into teacher characteristics of subject matter knowledge, pedagogical knowledge and pedagogical content knowledge, focusing on pre-service and in-service education. I analyze the importance of mastery of the three phenomena as essential needs for initial teacher preparation, as well as professional development.

Chapter 5 concerns the methodological solutions of the study. The research questions and the phenomenological approach are described, as well as principles that guided the selection of subjects and the procedures for the analysis of the research materials. The section consists of a well-constructed data analysis structure. Ethical considerations in relation to the analysis and interpretation of the data are finally discussed.

Chapter 6 deals with analysis of the findings of the two research questions, in the form of teachers' experiences of constraints to their teaching, and actions for improvement after professional development courses. Looking across the categories and aspects, two apparent types of phenomena that cause critical constraints to teachers' work, and three individual teacher character types are discussed. The results are presented in terms of categories and aspects. The aspects describe the categories.

The individual teacher character types and teacher's stories set up typical primary school classroom scenarios as part of this chapter.

Chapter 7 concludes with discussion of the results and summary of the study. Some methodological considerations, implications of the results and suggestions for further research are discussed.

2 Context of the study

In this chapter two themes will structure the discussion. First, an overview of the formal education system in Tanzania is presented. This is followed by an overview of teacher education in sub-Saharan Africa, and then by an overview of the Tanzanian teacher education context focusing on regular pre-service education and in-service teacher education. Second, the EQUIP program in Shinyanga is highlighted. The purpose is to locate the research phenomena, teaching constraints and actions taken for improvement in the professional development framework.

2.1 Tanzanian formal education system

The Tanzanian formal educational system can be divided into three levels: basic, secondary and tertiary. The basic education level includes pre-primary, primary and non-formal adult education. The official age for starting primary education is 7. Primary schools cover standards 1-7 and the education is free and compulsory. At the end of 7 years the learners take the Primary School Leaving Examination (PSLE) (MoEVT, 2011).

Secondary education is divided into two main categories: four years of ordinary level, followed by two year of advanced level. Those graduating from ordinary level gain entrance to teacher education to obtain the Grade A certificate for teaching in primary schools. The advanced level gives entry to tertiary education and to the Diploma course in teaching and prepares students for teaching in secondary schools (MoEVT, 2011). An overview elaboration of the structure of formal education system in Tanzania is summarised in Figure 1.

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┌─────────────┐   ┌─────────────┐   ┌─────────────┐
│ Primary     │   │ Ordinary    │   │ Advanced    │
│ education   │→  │ secondary   │→  │ secondary   │
│ (7 years)   │   │ education   │   │ education   │
│             │   │ (4 years)   │   │ (2 years)   │
└─────────────┘   └─────────────┘   └─────────────┘
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 ╭──────────╮    ┌─────────┐   ┌─────────┐   ┌─────────┐
 │ Pre-     │    │ Std 1   │   │ Form 1  │   │ Form 5  │
 │ Primary  │→   └─────────┘   └─────────┘   └─────────┘
 │ (2 years)│    │ Std 2   │   │ Form 2  │        ┌──────────────┐
 ╰──────────╯    └─────────┘   └─────────┘        │ Tertiary     │
                 │ Std 3   │   │ Form 3  │   │ Form 6 │ education    │
                 └─────────┘   └─────────┘   └───────│ (3 years)   │
                 │ Std 4   │   │ Form 4  │        │ or higher    │
                 └─────────┘   └─────────┘        │ courses      │
                 │ Std 5   │                      ├──────────────┤
                 └─────────┘                      │ Job-related  │
                 │ Std 6   │                      │ courses      │
                 └─────────┘                      ├──────────────┤
                 │ Std 7   │                      │ Vocational   │
                 └─────────┘                      │ training     │
                                                  │ (2 years)    │
                                                  └──────────────┘
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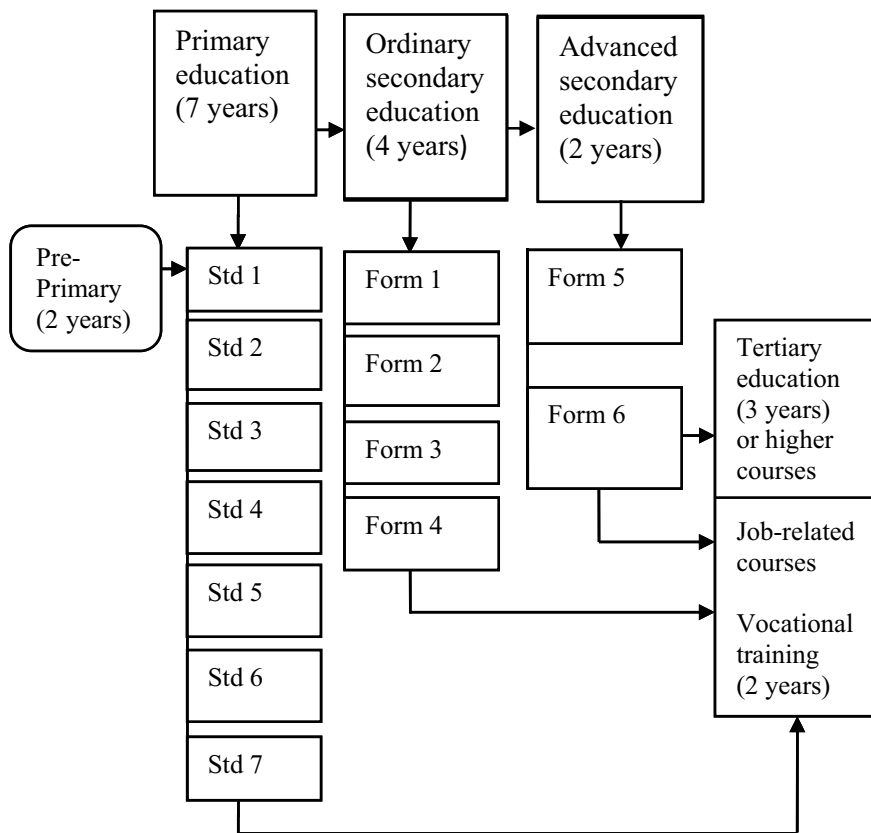
Std 1-7 refers to Standard (Grade) 1 to 7

Figure 1. Structure of the formal education system in Tanzania

In the figure the arrows indicate the possible educational path or the transition routes of targeted age groups and the education levels.

2.2 Teacher education

Teacher education is perceived as a service activity for the education system and is perceived to be at the heart of all development schemes. Countries have recognized education as one of the major areas of focus

for poverty reduction, economic progress, and social and cultural development (Thakrar, Zinn & Wolfenden, 2009). Through it, pre-service and primary school teachers are enabled to acquire the knowledge, behaviours and skills required for teaching in the classroom (Lukanga, 2012). Teacher education constitutes four elements: improving the general educational background of trainee teachers, increasing their knowledge and understanding of the subjects they are to teach, improving pedagogy and understanding of learners and learning, and developing practical skills and competences.

Before I go on to the discussion of regulating frames to Tanzania, I will contextualize my perspective in trying to expose some characteristic features of teacher education in sub-Saharan countries.

Sub-Saharan Africa perspective: Teacher education and training in sub-Saharan African education systems are suffering from the rapid expansion of their education (Moon & Wolfenden, 2012). The most critical challenge is the shortage of teachers to implement Education for All (EFA). The challenge is how to prepare qualified teachers and ensure they are sufficient in numbers. In Africa, and sub-Saharan countries in particular, the challenge is amplified by the significant number of un- and under qualified teachers. These teachers urgently need access to professional development programs.

Across sub-Saharan countries the minimal levels of qualification required for teachers are lower than in other regions. In Congo and Mozambique, for instance, less than two-thirds of teachers meet the minimum international standards of lower secondary education. Thus, the lack of trained teachers impacts learners' achievement. However, despite the urgent need for training as many teachers as possible, quality has to be a fundamental criterion (Thakrar, Zinn & Wolfenden, 2009).

South Africa perhaps is one example of countries in sub-Saharan Africa that has attempted to move towards a more practical outcome focused-model. However, the challenges facing teacher education and development are significant. They include a lack of access to quality teacher education and development opportunities for pre-service and

primary school teachers; a mismatch between the provision and demand for teachers of a particular type; system failure to achieve dramatic improvement in the quality of teaching and learning in schools; a fragmented and uncoordinated approaches to teacher education and development, and the weak involvement of teachers

In order to meet these challenges, South Africa has introduced an integrated strategic planning framework for teacher education and development 2011-2025. The primary outcome of the strategic plan is to improve the quality of teachers and training. The plan pertains to all teachers and at all levels (from grade R - grade 12), including classroom teachers, school leaders and managers, and other professionals who support teaching and learning at the school level[2]. In addition, the plan addresses the career of teachers through a number of phases from recruitment to retirement. As such, the plan places teachers at the centre of all efforts to improve teacher education and enable them to take responsibility for their own development with the support of the department of basic education, and department of higher education and training, teacher union, and the South Africa council for education.

The development and recruitment of teachers is a concern in rural areas in particular. Rural areas are disadvantaged and associated with high levels of poverty. The low-income countries are the most seriously affected. The provision of adequate qualified teachers is also problematic due to high cost. Therefore, this shortfall of trained teachers has led to the employment of unqualified (para-professional) teachers across the region. According to a UNESCO (2000) survey of 11 eastern and southern African countries, one-third of primary school teachers were untrained. For instance, in West Africa, the report indicated that there was an increase in para professional teachers with short pre-service training of only a few months or weeks.

The increase in enrolment in primary schools in Uganda has also affected teacher education in the country. The expansion of class size in primary schools has increased the urgency of the need for the government to

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[2] www.education.gov.za/LinkClick.aspx?fileticket 2011

improve the quality of primary education (Holland, Long & Regan, 2012). However, poor learner engagement in the learning process and the limited repertoire of content knowledge and pedagogical knowledge have limited and prevented the goal of achieving quality education in the country.

In Malagasy, dropout rates are high. Primary education completion rates are less than 45 percent. Only 30 percent of the enrolled children continue up to the age of 10 (Stephen, 2012). Malagasy face similar challenges to those seen elsewhere in other countries in the region. These include lack of qualified teachers, and inadequate pedagogical content knowledge to transform teaching and learning. Despite the challenges discussed, efforts have been made by the governments to improve teacher education and the education system in general.

In summing up, learning from sub-Saharan African teacher education, the countries face common related challenges that hinder the development of teacher education and quality teaching and learning. These include low preparation of teachers in terms of the subject content and pedagogy, weak teacher education systems, low budgets, poor infrastructure, and a lack of induction and professional development programs.

2.2.1 Pre-service teacher education

Pre-service teacher education is a crucial process in preparing competent teachers (Lukanga, 2012; Villegas-Reimer, 2003) because it lays the foundation for future professional development. To produce effective learning, teacher education has to offer more learning opportunities to teachers (Feiman-Nemser, 2001). It has been suggested that in preparing teachers, emphasis has to be put on subject matter knowledge, pedagogical knowledge and pedagogical content knowledge (Shulman, 1986), which will be discussed further in (4.1.2).

In Tanzania, teacher education institutions have been training and re-training a vast number of primary school teachers to meet the high enrolment demand. However, it has been realised that these teachers have been trained with little academic knowledge and pedagogical knowledge

(Mosha, 2006). The aim was to supply qualified and capable teachers to meet the current education realities (Lukanga, 2012). The former (academic knowledge) is knowledge about the subject to be taught and the latter (pedagogical content knowledge) is knowledge about the act of teaching, including the goals, procedures, and strategies that form the basis for what teachers do in the classroom. It is the ways of presenting the subject matter (Shulman, 1986).

A two-tier teacher education system: Tanzania has expanded its primary education enrolment in order to achieve universal primary education by 2015 (Hardman, et al., 2012). This has created a problem of inadequate teachers and resources to meet the huge enrolment rates. It has also affected the teachers' work. In trying to solve the problem of shortage of teachers, a two-tier education program was introduced, (MoEVT, 2006) as discussed and defined in Chapter 1.

In the first part of the course, student teachers spend one full year in college, mostly learning the theoretical part of the course During the second part of the course student teachers are placed in schools, where they put theory into practice. This was one way of solving the big shortage of teachers in schools due to the massive increase in enrolment. It was assumed that the teacher trainees would be supervised and mentored by teacher educators, head teachers and school inspectors, but such support and guidance has been limited (Bhalalusesa et al., 2011).

The two-tier program in Tanzania was a short-term solution for preparing teachers and was adopted as an intervention when there was great demand for teachers to cover the gap that had occurred. Quantitatively, this was achieved, with 39,022 primary school teachers being educated during phase one of the Primary Development Education Plan from 2002 to 2006.

However, over time, criticisms have been made concerning teachers educated under the two-tier program as being ill-prepared and under-qualified to meet the needs of the learners (Mosha, 2006). As a result, primary education in the school system is poor because of the low quality of teacher education. It has been observed that some learners complete

their seven years of primary education without having acquired the basic skills of reading, writing, and arithmetic (Uwezo, 2010). In this regard, professional development is no longer an option but an expectation of all professionals (Komba & Nkumbi, 2008).

2.2.2 In-Service education

Tanzania has always struggled to get enough students with qualifications to enter teacher education. The short period of preparing teachers led to minimum qualification requirements for those admitted into teacher education (Mosha, 2006). Providing professional development programs for teachers in Tanzania is unavoidable, as discussed in the background introduction because the majority of the teaching force has been trained through the two-tier program, the quality of which is questionable. Professional development programs are also inevitable due to the increased number of untrained teachers (Towse, Kent, Osaki & Kirua, 2002) and also the education reforms that are taking place within the education system and society.

For instance, a study performed by Ottevanger, de Feiter, O-saki and van den Akker (2005) on secondary school science teachers in Tanzania revealed that students joined the university without having been exposed to science subject instruction. Teaching approaches in secondary schools were characterised by memorisation of a large amount of verbal information to pass examinations. Practical activities and demonstrations were hardly done at all and the attitudes towards learning focused on memorization. When trained to become teachers, they carried this attitude forward into their own teaching practice.

A comparative study by Abagi and Sifuna (2006) in Kenya and Tanzania revealed similar findings on untrained teachers. For both countries, Kenya and Tanzania, the increased number of unqualified teachers has led to the need for professional development. This has an immense impact on teachers' competence in quality teaching and learners' performance and achievement. They observed that teachers have a poor command of pedagogical knowledge and subject content knowledge.

Professional development is a relatively new phenomenon, particularly in developing countries. The commonly used terms are in-service training, staff development and teacher development. Professional development can be defined in different ways according to the need. Villegas-Reimers (2003) defines it as a *"long-term process that includes regular opportunities and experiences planned systematically to promote growth and development in the profession".* These can be in the form of seminars, workshops, short courses, professional meetings, consultation, peer and colleague support as well as mentoring.

Generally, several short and long-term professional development programs have been carried out within the country and across subjects by non-governmental organisations and the government. Some of the government initiatives are such as the *Teacher Educators' Program initiated in 1997* by the Teacher Education Department in the Ministry of Education and Culture (Hojlund, Mtana & Mhando, 2001); *Open Distance Learning (ODL)*, (Mnyanyi & Mbwete, 2009); and *Diagnostic Teaching Techniques* by UNESCO through its program known as Teacher Training Initiatives in Sub-Saharan Africa (TTISSA) (Chediel, 2010).

On the other hand, in recent years many non-governmental Organisations, both local and international, have gained an important role in development work, with education being the major concern. There are many professional development programs for teachers organized by NGOs within Tanzania. These include UNESCO through its program-TTISSA, UNICEF, CARE Tanzania, Oxfam Tanzania, Aga Khan Foundation, Action Aid, Save the Children and VSO. My discussion will go deeper into the EQUIP program, one of Oxfam's program in Tanzania. I have chosen this program because of its uniqueness in providing cluster-based professional development courses to all teachers in the program area (Hamilton, et al., 2010). Furthermore, it provides a school-based mentoring service to teachers within the program area rendered by trained fellow teachers. Finally, I have adequate experience of the program because it is where I have been working.

Professional development on subject matter knowledge, pedagogical knowledge and pedagogical content knowledge for the teachers has

proved to have positive results (Hamilton, et al., 2010). Some of the positive results are improved teaching methods and classroom management practices, as well as, knowledge, skills, and attitudes, which consequently have improved classroom practices.

Management capacity: School management capacity is the ability of the heads of schools to perform their duties. This includes supporting teacher professional development at the school, providing teaching materials and motivational packages to teachers. Their ability depends on the way they have been empowered in terms of management knowledge, skills and school culture (Komba & Nkumbi, 2008).

The improvement of classroom practice depends not only on the teacher, but also on support from the school management. Support of school management is necessary for promoting teacher development and quality teaching. This can easily support the Organisation of school-based development programs for the under-qualified teachers, since the head of the school is an important player and the main implementer of school management. (Mosha, 2006; Towse, Kent, Osaki & Kirua, 2002;)

2.3 Primary education context in Tanzania

Tanzania has made significant progress over the past ten years to increase access to basic education (United Nations International Children Education Fund-UNICEF, 2011). Access to education has vastly improved, notably following the introduction of the Primary Education Development Program (PEDP) in 2001 and the abolition of primary school fees in 2002. The decision to drop school fees threatened to reduce the quality of education, as thousands of learners enrolled in already overcrowded and under-staffed schools. For instance, between 2005 and 2009, enrolment in primary schools rose over seven million to nearly eight and a half million, an increase of 11.9 percent. As a result, the current primary school enrolment rate is 95.5 percent (UNICEF, 2011). In spite of the gains, the increase in enrolment in Tanzania is compromised by high non-attendance and high dropout rates, which are influenced by lack of qualified and competent teachers.

Similarly, in Kenya primary school enrolment increased from 5.9 million in 2002 to 7.2 million in 2004, (Abagi & Sifuna, 2006). In both Kenya and Tanzania, large classes and shortages of teachers have affected teaching and learning outcomes in primary schools. Based on the challenges of having unqualified and untrained teachers and large classes, there is a need for professional development, especially in how to manage large classes.

Due to a high enrolment rate in the two countries (Kenya and Tanzania), teachers have been handling large classes of 60-80 (Abagi & Sifuna, 2006). Class size can affect learners' engagement behaviour and retention. In big classes, learners hardly get the attention required, and hence learning is negatively affected. For instance, a survey done in Kishapu District Council (with 116 primary schools) in Shinyanga region shows that many of its schools have a high learner to teacher ratio (See Table 5 in Appendix 4).

The general average learner-teacher ratio in Shinyanga is 49:1 according to Basic Education Statistics in Tanzania (URT, 2012). This general statistic does not correspond with classroom realities. Observations made in 13 Shinyanga municipal classrooms from six schools indicated that learner-teacher ratios are higher than the desired standard ratio in Tanzania (see Table 1).

Table 1. Learner-teacher ratio

Number of School	Name of the primary school (given name)	Grade	Learner teacher ratios
1	Mbalamwezi	V11	70:1
2	Bakita	11	90:1
2	Bakita	V1	80:1
3	Mapita 'A'	1V	75:1
4	Mawenzi	1	91:1
4	Mawenzi	11	92:1
4	Mawenzi	11	80:1
4	Mawenzi	1V	60:1
4	Mawenzi	V	80:1
5	Buja	V	80:1
5	Buja	V1	80:1
6	Amati	1V	90:1

Source: Shinyanga Municipal database (2013)

Instructional materials in primary schools: Teachers in Tanzania are struggling to teach with few resources. Instructional materials are resources for teachers to support learners in acquiring knowledge, skills, and attitudes. The availability of teaching materials in Tanzanian primary schools is a major challenge. In this study the terms instructional material, teaching material or teaching aids are used interchangeably in meaning materials to aid the process of teaching and learning.

Sifuna (2007) argues that quality teaching is inevitably related to the availability of instructional materials. With the increase in enrolment in Tanzania, many schools are unable to cope with the available limited resources. The consequence of the high influx of learners limits the availability of instructional materials and classroom interaction. The major classroom material in Tanzanian primary schools is the textbook. Learner-textbook ratios in the Shinyanga district in particular ranges from 3:1 to 10:1, again varying with subjects and schools.

A survey done in Dar es Salaam[3] in 40 primary schools revealed that the availability of textbooks is critical to learning. Textbooks are lacking in most schools. The average learner to textbook ratio is 5:1 in lower grades (grade1-4) and 6:1 in upper grades (grade 5-7). Across schools there is major variation ranging from 2:1 to 45:1. In some schools, only the teacher had a copy of the textbook. In those schools with a low ratio most of the learners brought textbooks purchased by their parents. This will be discussed further in 3.1.4 and more examples will be included.

2.4 EQUIP work in education

My study was carried out within the EQUIP program, in Shinyanga region in two district councils, the municipal and rural district. The region is located south of Lake Victoria at 20 to 160 kilometres from the shorelines, forming part of what used to be known as Sukuma land. Shinyanga region had seven districts; amongst which one is called Shinyanga. The region and the district are named after the town. The district comprises two councils, the municipality and the rural urban, which is the area of the study (see Figure 7). However, in 2012 Simiyu region was created from part of the Shinyanga region, which now has only three districts including the Shinyanga district.

The EQUIP program was launched in 2003 to address the challenges related to the traditional 'chalk-and-talk' teaching methods. The main aim of EQUIP as explained in the background is to improve the quality of teaching and learning in primary school classrooms in the program area through professional development.

In order to achieve the aim, the program activities were organized under four broad components that form the EQUIP model (see 4.2.2, Figure 4): to support learner-centred learning, to support a *good* learning environment, to support *good* school governance, and to deal with other factors that limit learning such as safe water and school meals in schools. I have used the term *good* to denote high quality. The EQUIP model will be discussed in detail in (4.2).

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[3] by the Uwazi newspaper (2010)

EQUIP implementation strategy: The project applied a reflective cascade approach[4]. A cascade is a series of activities or events that occur in successive stages, each of which is dependent on the proceeding one to produce a culminating effect (Hayes, 2000). In such an approach, implementers can easily manage the effects of the activities. I chose to apply a cascade approach due to its potential of ensuring flexibility and continuity of the activities. In the EQUIP program it allowed flexibility implementation of the activities. The guiding principle of the approach is that through reflection teachers can understand their practices in order to enhance teaching practices to improve quality education.

Cascading in the EQUIP consists of two aspects: on the one hand, as a methodology and a means of intervention implementation; on the other hand, a reflection process, offering ways of assessing the progress and achievement of the intervention for further re-planning (Hamilton et al., 2010). EQUIP introduced reflection sessions within the cascade approach to give room for individual assessment and evaluating the progress and development of teachers, learners and the system's capacity to support best practices and sustainability of the project.

Some educational literature describes reflection as a wholly beneficial practice for teachers. Professional Development for Academics Involved in Teaching-ProDAIT (2006) defines reflection as an active process of witnessing one's own experience in order to explore in greater depth. It is also about recognition and examining the ways they teach. For this study reflection is referred to as a tool or a means for monitoring, assessing and evaluating the process of teaching and learning, i.e. a process in which teachers can recall, consider and evaluate their experience. Reflection also is a process of 'mirroring' their teaching actions, unfolding teachers' own assessment to improve classroom actions. Teachers tend to bring certain beliefs, assumptions, knowledge, attitudes and values to teaching, based on their own experience.

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[4] A reflective cascade approach also refers to a way of organizing plans and provisions so that it is easy to check relations between issues, objectives, policies and rules through reflection. *(www.qualityplanning.org.nz/index.../510-cascade-approach)*

The key to reflection is learning how to take perspective on one's own activity and experience. Reflection in the cascade approach was meant as a tool for improving subject content, pedagogy and planning of teaching actions. As far as teaching is concerned, teachers perceived reflection as looking at what they do in the classroom, thinking about why they do it and thinking about whether it works and giving reasons for the answers. Thus, it is making deliberate choices in the classroom (see van Manen, 1990).

Through reflection teachers were able to look back on their actions and asking questions about 'what,' 'how' and 'why'. Reflection was seen as a fundamental requirement for improving teaching and learning. It was a mirror and a tool for understanding one's actions and the general environment of the classroom in terms of instructional methods, subject content, and ways of planning and delivering the lesson.

Professional development within EQUIP: The identified course pattern for teachers' professional development included other key education stakeholders (Figure 2). This was done because teaching is both an individual and a collective activity (Hansén, 1998) that needs support from various stakeholders. The idea of collectivity can go beyond education institutions to the community. Schools were organized into clusters where four to five schools formed a cluster depending on their accessibility. The training mode was therefore cluster-based, ranging from one week to two weeks. Four well-organized courses (phases) were organized in a year, as shown in Figure 6.

Educated and qualified teachers and mentors served as facilitators in the EQUIP program. This formal arrangement for professional development was supported by team teaching and sharing of experiences through reflection. However, it was not always possible to reach all clusters within a specified time (Sedere et al., 2008). Short courses offered to teachers were a massive incentive to the majority (Halmiton, et al., 2010). The assumption was that key education stakeholders would provide moral and financial support for the implementation of the project activities.
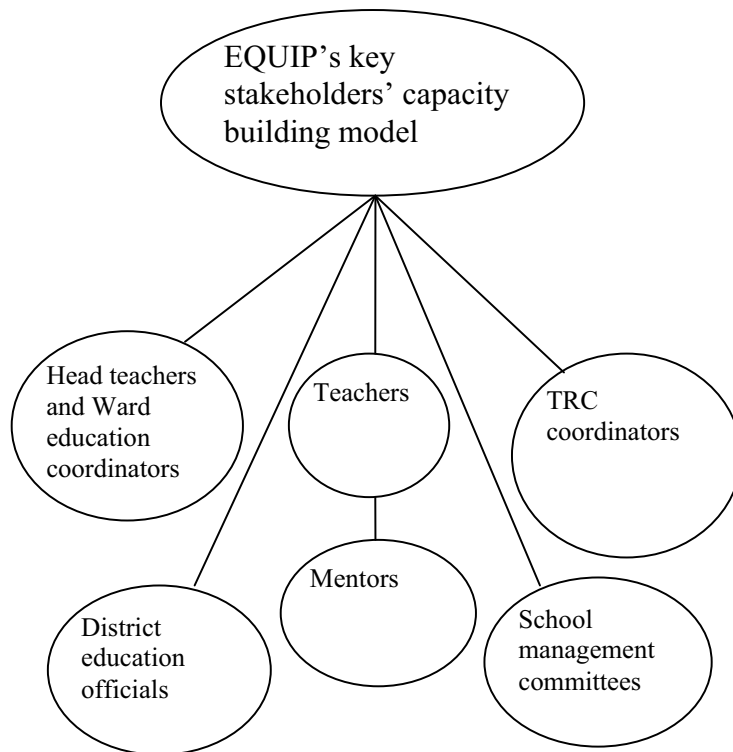
Figure 2. EQUIP's capacity building model for key education stakeholders.

From the designed professional development model (Figure 2), EQUIP has involved more than 2000 teachers from 172 primary schools; 340 school-based mentors; 24 teacher resource centre coordinators, 170 facilitators of teachers, and 172 head teachers as well as 29 ward education coordinators, 688 school management committee members and 38 district education officials (Hamilton et al., 2010). These statistics suggest the impact of EQUIP in the program area through a reflective cascade approach, which will be discussed in 4.2.

The model brings in a change of culture into the teaching profession. EQUIP has made great strides in transforming the nature of teachers'

development (Sedere et al., 2008). The establishment of facilitators of teachers and mentors has been a major factor of liberation in the profession. Through cluster-based programs teachers were educated and supported by their peers (the facilitators). Expert teachers were selected to provide mentor support to fellow teachers.

The mentors work with the teachers following an action research approach. They identify problems together, look for strategies together, work out solutions separately or collectively and then evaluate the improved practice together. Thereafter, they look for another problem and work it out in the same manner. Mentors in the EQUIP program have been helping teachers to assess their teaching and learning needs and established development plans.

Through mentoring teachers are able to explore new ideas with confidence. There has been a recognized increase in the number of qualified teachers in the program area (Hamilton et al., 2010). In the context of professional development, mentoring can be a powerful personal and collective empowering tool. It may be a successful way of supporting teachers to progress not only in their profession but also in their career path.

In teaching relationships, the mentor acts as a coach, coaching teachers in different teaching methods, not just supporting managing their own learning, but also in developing their skills, improving their performance and helping them becoming the person they want to be. It is a kind of self-assessment where teachers take the chance to look closely at themselves and their beliefs about teaching. The challenge that mentors face is the balance of time due to their heavy teaching load.

Clarification of concepts: Professional development is a process of developing the individual's skills, knowledge, and expertise of a teacher, both for personal development and for career advancement (OECD, 2009). Here it means capacitating teachers through short courses, seminar and workshops offered to improve classroom work. In the school context professional development refers to improving and increasing the capabilities of teachers through education opportunities in the workplace or through observing other teachers while they teach. Villegas-Reimers

(2003) further explained professional development as a person's professional growth in her or his professional role; it can also be viewed as an occupational instruction, meaning a process of promoting teachers' professional knowledge, skills, and experiences that are shared. The aim is to equip teachers with the tools and materials required to provide quality teaching.

Dembélé and Lefoka (2007) define professional development as 'pedagogical renewal' meaning planned qualitative change towards desirable teaching practice. The qualitative change can be expressed as a process of developing teachers' subject content knowledge, pedagogical knowledge and pedagogical content knowledge.

I have opted to use the notion professional development as key to this study for the following reasons: first, is a process of improving both the teacher's academic levels, as well as acquisition of competency in teaching. This view seems to fit the Tanzanian context in the EQUIP program. In educational systems where teacher education programs are well established, professional development is described as a process embracing all activities that enhance professional career growth.

2.5 Conclusion

The discussion has shown that increased primary school enrolment has created great demands for teachers to cope with unmanageable classrooms and caused constraints in teaching. Due to high demand for teachers, the government reduced the entry qualification of student teacher trainees and the time for teacher preparation (by *introducing the two-tier program)*. This resulted in a situation where the majority of teachers have been observed to be ill-prepared and under-qualified, as well as in a decline of the quality of teaching and learning outcomes. In such cases, professional development courses for teachers can be one way of developing and meeting the need for action to improve educational quality.

An evaluation report of the EQUIP program has been considered a successful model for teachers' development in the project area. Even

though, the question remains as to whether the government will be able to maintain the best practice learned from EQUIP. This can be a question for further investigation.

3 Limiting and enabling frames to teachers' work

In this chapter, limiting and enabling frames to teachers' classrooms and schools are discussed. There are several factors influencing teachers' work; however, for this study the class size, instructional materials and teaching and methods constitute the classroom frames. On the school level, teacher supply and demand, teacher dropout, and students' and parents' perspectives are discussed.

3.1 Classroom limiting and enabling frames

In this section, I have used the phenomena limiting and enabling to cover aspects like teaching constraints, behaviours and ways of thinking about teaching (URT, 2012). The frame refers to relations within boundaries. That is the degree of control teachers and learners possess in the classroom. Thus, a classroom is a place a teacher spends much of her/his time of a day with the learners. It is a complex social system in which teachers and learners interact in a variety of ways in the classroom (Scott, Alter & Hirn, 2011) and teachers transform the subject content into learning. A classroom attempts to provide a safe space for both the teacher and the learners where learning can take place without distractions.

Teaching is the core business in a classroom and a shared enterprise involving teachers and learners. In practice, teaching structures and activities can vary from the expectations of both the teachers and learners, based on the strategies that teachers use and activities for the learners. Duit and Treagust (2003) refer to the variations in conceptual changes. This means the process of restructuring pre-instructional understanding to develop new interpretations and acquire new knowledge. The process of restructuring involves changes in both classroom practices and beliefs about knowledge. Teachers' classroom practices strongly influence the

level and nature of behaviours they want to change and the nature of the class size.

3.1.1 Class size

Many factors affect the teaching process: textbooks, quality of teachers, time, Organisation, management, leadership and class size. Among these, class size is one of the most significant framing factors. Different researchers define class size quite similarly, as the number of learners for whom a teacher is primarily responsible and taught by the teacher at a particular time (Sumra, 2004).

A class size is different from learner-teacher ratios, which are calculated by dividing the number of enrolled learners in an educational unit by the number of full-time equivalent teachers assigned to the unit (UNESCO, 2001). This kind of ratio does not provide an accurate reality of the class size. For example, data from Basic Education Statistics in Tanzania, indicates that in Shinyanga region the learner-teacher ratio in 2011 was 54:1 and 49:1 in 2012 (URT, 2011; 2012). In real situations, there are great variations within districts, schools and subjects in the country (see Table 1 in 2.3 and Table 5 in Appendix 4).

A class can be a *small size* or a *large size,* but in both cases, teachers are expected to teach in a successful way in order to meet the learners' interests and needs. The focus is on primary schools because my study is about primary school teachers' experiences. The notion of *'small'* or *'large'* classrooms differs with different contexts.

What is a small class? What is a large class? Defining a *small class* 'automatically' defines a *large class*, because a large class is a class where the number of learners exceeds the maximum for a small class. Thus, a small[5] class is defined differently within countries. A small class is one having as few learners as desired in a class in a specified context.

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[5]   A small class varies within countries. In developing countries, a small class ranges from 30 to 40.

A large class in one country can be a small class in another. The opposite is also true, especially when we compare Western countries with sub-Saharan African countries. For instance, a class of 40 learners in Tanzania is considered to be a small class and a desired one (URT, 2011), whereas in the United States it is considered to be a large class (Nye, Hedges & Konstantopoulos, 2001). The literature indicates that most of the countries in sub-Saharan Africa suffer from large classes (Abagi & Sifuna, 2006) as discussed in chapter 2. This reality means that some classes in Tanzania primary schools have more than the desired 40^{6} learners and go up to 100 learners per class, per teacher (Hardman, et al., 2012; see also Table 1 in 2.3 and Table 5 in Appendix 4).

Bennell and Mukyanuzi (2005) carried out a study on primary schools in two locations: urban and rural districts of Temeke in Dar es Salaam, and Muleba in Kagera region, in the western part of Tanzania. The sample included head teachers and subject teachers, where 35 teachers were interviewed. The results revealed that a small class is desirable since it allows learners to receive individual attention from their teachers. When compared to a large class, they argued that it is difficult for a teacher to follow up and assist an individual learner in a large class. In such a situation, learners seem to be passive when in contact with their teachers.

However, Harfitt (2011) claims that the difference in class size has stemmed from teachers' own perceptions of their classrooms. Teachers feel that a small class will improve the quality of teaching and learning and that class size reduction leads to better behaviour, easier classroom management, and development of more positive attitudes in learners. The literature acknowledges that having fewer learners in a class enables the teacher to pay more attention to individuals and engage them in the learning process, so the classroom becomes active, and the achievement increases.

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[6] 40 is the standard number of learners per teacher in a class in Tanzania. It is what the country (Tanzania) terms as a small and manageable class for one teacher. It is based on pupil to teacher ratio (40:1). However, it is still far from being reached since most of the classes have more than 40 and up to 100 learners in a class with one teacher.

Class size and learners' engagement: Learners' engagement can be expressed in two forms: social and academic engagement. Social engagement refers to how learners interact among themselves and with the teachers. Academic engagement refers to learners' attitudes towards education and the learning process. Nye, Hedges & Konstantopoulos (2001) argue that in a small class, learners can be more engaged both academically and socially. In the STAR project, for instance, lower grade learners were organized in classes of 13 to 17. The results indicated that these classes had a positive impact on reading and mathematics achievement. However, when the number of learners in the classroom increased to 22 to 25 in upper classes their performance dropped.

Wilson (2006) claims that in large class learners spent less time on assignments when compared to small classes because teachers spent much time on classroom management and solving disciplinary matters. A large class may restrict the level of class social engagement and the way learners interact with each other. In such a situation, reducing only the number of learners in the classrooms perhaps may have little impact without focusing on the professional development of the teachers. From this claim, class size cannot be considered in isolation from other pedagogical related variables because they are interdependent.

3.1.2 Teaching methods on class size

Teaching methods determine the ways a teacher and learners interact during the lesson. They constitute the actions and achievement of learners and are known to affect classroom work, since learners concentrate, internalise, and retain knowledge differently from one another (Kansanen, Tirri, Meri, Krokfors, Husu, & Jyrhämä, 2000). The notion teaching method is the teacher's concrete way of acting together with learners in the class. Every teacher's action in a classroom can be the result of decision that she/he makes during planning.

Urzúa and Vásquez (2008) state that teaching is not simply a matter of style, but largely entails various processes that need rational decision-making before, during, and after the teaching process; teachers have to be flexible in their teaching decision-making. Learners' outcomes are

influenced by the teachers' classroom decisions and actions. These decisions include planning, follow-up, assessment and evaluation, motivation, pre-planning and collaboration with other stakeholders.

Teaching methods determine classroom practices for both teachers. Practice implies a particular perspective on human work and is always socially shared. Practices are a reutilised type of behaviour that consists of several interconnected elements, such as form of bodily activities, form of mental activities, tools and their use and background knowledge in the form of understanding. A practice is constituted by human actions through doings and sayings. However, large classes can negatively affect these practices and the social communication of the learners and thus probably decrease the teacher's motivation and job satisfaction.

In Sub-Saharan Africa, countries share challenges related to teaching methods indicate teacher-dominated talk promoting rote learning and recitation (Holland, Long, & Regan, 2012). For example in Uganda, poor learner interaction in the learning was observed. In such interaction, supporting teachers through professional development, transform their classroom practices into an interactive teaching process is crucial, because methods are fundamental for promoting teaching and learning. In that way, teachers can learn more from each other, as well as help learners transform and construct the learned material into actions.

Choral repetition has dominated in most classrooms in Tanzania (Hardman, et al., 2012). Choral repetition can be termed as a kind of rote learning where learners just imitate and follow the voices of their peers, not necessarily understanding the subject, concepts and content being taught. It expresses the general approach to teaching of some teachers, emphasising the whole class repeating aloud. Teachers tend to rely on whole class vocal choral repetition. In that viewpoint the memorization of facts may not contribute to understanding of the lessons taught since it is taken as a body of knowledge as it appears in the textbook.

A study by Hardman, et al., (2012) on reforming teacher education in Tanzania revealed that questions were the most frequent teacher elicitation in the classroom, followed by cue elicitations and teacher

explanations. Choral responses were therefore the dominant method of responding to a teacher initiation, taking up 62 percent of the class time, compared to 35 percent of individual responses.

3.1.3 Classroom management

Classroom management involves the teacher's capability to ensure that classroom work runs smoothly and avoids disruptive behaviour by the learners. Teaching in large classes in particular means continuous challenges for the teachers, because once control is lost, it means it is increasingly difficult to regain (Walberg & Paik, 2000).

Herbert and Worthy (2001) found success mainly derived from successful behaviour management and incorporation into the school culture or plans. Teachers who succeed in behavioural management are also likely to reach academic success. Also, teachers, who consider classroom management as a process of establishing and maintaining active learning environments, tend to succeed more than those who place main emphasis on disciplinary matters.

There are many ways of managing classes, for instance, listening to the learners, encouraging excellence, and offering the opportunity for them to express their views. The time spent by the learners working in the classroom seems to determine the gains (Jasem, 2007). The learner's personal experience within the learning environment is a determining factor as to whether the teachers' classroom management behaviour has positive or negative results. To build positive classroom management, teachers need to provide a variety of classroom activities and ensure that learners are actively engaged in learning, as well as applying methods that will engage them in the learning process.

3.1.4 Classroom instructional materials

The main instructional material used by the majority of teachers in the sub-Saharan countries and Tanzania in particular is the textbook (Hardman et al., 2012). In Chapter two (2.3) a definition of instructional materials was given and the situation of teaching materials in some parts

of the country briefly discussed. In this section the purpose of the discussion centres on considering the textbook as the predominant source of teachers' work in Tanzania.

Effect of textbooks on learners' outcomes: The textbook is an important instrument for the teacher's work in the sub-Saharan countries. It could also be an effective means of improving cognitive development and educational achievements. The textbook is considered important for teaching in terms of choice of content and methods, as well as for selecting activities for both the learners and teachers. From that viewpoint, the textbook has key roles to play, as far as, teaching and learning are concerned.

The supply of textbooks in primary schools in Tanzania, as in Kenya, depends on funds through a capitation grant of $10 per learner (Sifuna & Abagi, 2000). The provision of grants for procuring materials reduces the learner to book ratio, improves the enrolment ratio and also the completion rate.

Hardman, et al. (2012), claim that only 40 percent of the capitation funds are used for textbooks. Textbooks are the predominant source in most lessons and can provide an opportunity for learners to work independently but the overstretched instructional materials in large classes risk creating an unfavourable learning environment, seriously undermining the quality of education in Tanzania.

The development of textbooks follows the traditions and the philosophy of the country. For instance, the Tanzanian education philosophy since it was introduced in 1967 has been *Education for Self-Reliance (ESR).* ESR is the guiding philosophy for education in Tanzania. Since independence, Tanzania has made deliberate changes in the education system so that it could respond to its aspirations of becoming self-reliant.

Among the fundamental principles of the ESR policy, was the intention to liberate individual learners in terms of knowledge, skills and attitudes to make them self-reliant. Principles were translated into textbooks and used by the teachers and the learners. Access, equity and quality are key

elements of the ESR (Mbilinyi, 2000). The ambition has been to develop the learners, thus helping them and society to eradicate poverty, ignorance, and disease, as well as, to bring about political and economic freedom. Through the ESR policy, Tanzania has achieved significant successes in the eradication of illiteracy as well as in the provision of universal primary education (UPE) (Mbilinyi, 2000).

Textbooks play a big role in Tanzanian classrooms because there are no other resources to support the teachers' work. Primary school teaching depends solely on the availability of textbooks. Despite the ICT policy being in place, in 2005 only 501 (3.1 percent) out of 16, 001 primary schools have introduced ICT skills, with computers for office use and training but not for teaching and learning (URT, 2011). The textbooks are inadequate in many schools and affect all classes from lower to upper classes (Hardman, et al., 2012). Teachers would find it easier to plan and keep their classes more active in classrooms with textbooks than in classes with inadequate or no textbooks.

Lack of textbooks and learners' learning: The Education Sector Performance Report (ESPR) 1009/2010 from 15 regions of mainland Tanzania revealed that the average learner-textbook ratio varied widely between schools, from subject to subject, and from one local government authority to another (URT, 2011). Other research reports on primary schools in various areas of the country indicate the ratio to be alarmingly high across subjects (Hardman et al., 2012).

As introduced (2.2.1) a study by Hardman et al. (2012) involved a total of 236 primary school lessons covering the teaching of English, Kiswahili, mathematics and science in standard 3 and 6. These lessons were systematically observed in exploring the quality of teacher-learner classroom interaction and discourse in the schools. The results indicated that in lower classes the learner-textbook ratio was 10:1 in standard three and 6:1 in standard six. Ninety-four classes (40 percent) of the observed lessons had no textbooks for learners. These results also include the EQUIP program area in Shinyanga district. Teachers still spent much of the class time in writing on the chalkboard and learners copying into their exercise books.

Teachers can use textbooks for different purposes, these include laying down rules and conditions, explaining logical processes and going through worked examples and providing exercises to practice. In Tanzania, teachers regard textbooks as a starting point for teaching, the choice of subject content and the methods for instruction. As such, Wikman (2004) (cited in Björklund, 2007) argues that textbooks are less important in choosing teaching methods but important in choosing the subject content because textbooks can facilitate the teacher's work by providing ready-made tasks, activities and make it possible for learners to learn independently. With a lack of textbooks, teachers can fail to select the required curriculum content and learners may as a result fail to acquire basic literacy skills and numeracy.

3.2 Limiting and enabling frames in the school context

In this section, I discuss framing factors such as teacher supply and demand and learners' perspectives, focusing on school size, drop-out and repetition, and finally parents' involvement.

A school is a place where inputs are aimed at producing quality outputs progressively and systematically. It is an investment that strives to generate a better future life and income for individuals (Patron, 2008). According to Fancy, Unterhalter, Vaughan and Nussey, (2012) a school is a physical space filled with learners, teachers, textbooks, and so forth. A school could, more appropriately be seen in terms of the ways the physical space interact with and are used by the learners.

3.2.1 Teacher supply and demand

There is widespread and growing concern about teacher supply and demand. Supply refers to the availability and quality of school, facilities, materials and teachers, whereas demand is regularly determined by culture, family, and individual characteristics, sometimes stemming from parental decisions based on the opportunity cost of schooling (Sifuna, 2007).

Teacher turnover is a significant phenomenon and a dominant factor that dictates the demand for new teachers. There are various reasons for teachers leaving the profession, which include dissatisfaction with the profession, ageing, and lack of support in the early days of their career, and difficult environment (URT, 2012).

Job dissatisfaction and pursuing better jobs and other careers have been the major factors for teacher turnover in Tanzania. In 2012 for instance, 12.8 percent of teacher attrition was comprised teachers leaving the profession. This is an indication of not being satisfied with the profession. The majority were primary school teachers (80.2 percent) (URT, 2012). The figure is not only caused by the increase in the number of learners in schools alone, but also due to changes in the attractiveness of the teaching career relative to other careers.

The competition from other professions, when compared to the actual number of teachers needed, has a great effect on the supply part. For instance, some teachers have discouraged their own children from taking up teaching as a career. There is, therefore, a need to improve teachers' conditions of service in order to make the teaching profession more attractive. The problem persists because those who are prepared to teach many never enter the profession and those who attempt to teach leave the profession after few years (Bennell & Mukyanuzi, 2005). A general picture as in other countries shows that teachers leave the profession due to dissatisfaction.

Lack of support is one reported reason behind perceived dissatisfaction. But if teachers get support from their colleagues in the early days of their career then they are more likely to stay in the profession (Flores & Day, 2006). The importance of teacher support through mentoring means professional development and growth within the profession. Mentoring refers to support or counselling a less experienced person receives from a more experienced one with the aim of improving her/his work (Lindgren, 2000). In an educational perspective, mentoring is the process of an experienced teacher introducing or supporting a newly employed teacher in his/her teaching. The mentoring process not only benefits the young teacher but also the professional development of the experienced teacher.

Another problem related to the supply of teachers is their unsatisfactory competence. Some teachers have limited knowledge of the subjects taught, while others did not study beyond their specialist subjects at A-level (Henry & Thornton, 2001). Moreover, supply and demand are unevenly distributed between regions and subjects. Some areas can experience over-supply while under-supply characterises other areas. The problem of under-supply of course affects the quality of the classroom teaching practices. Many town schools are over-supplied while rural schools suffer from a lack of teachers.

Supplying teachers to some areas in Tanzania is considered difficult, particularly in some rural areas, because of unpleasant teaching environments. These include regions like Kigoma, Lindi, Tabora, Shinyanga, Singida, and Rukwa (Mhando, Mtavangu & Mtana, 2010). Schools are in places where there are no social services and basic needs such as water, transport, electricity, and medical facilities are far from their reach. These kinds of situations make teachers' lives costly and unbearable and some avoid working in such areas. In some schools, there are difficulties to employ certain subject teachers, for instance science teachers or teachers in mathematics and Kiswahili. All these situations create gaps that demand more teachers. Classes are congested, equipped with unmovable desks for interaction, and thus leaving limited space for learners to work and for teacher interaction (see Figure 12).

Teacher attrition: Teacher attrition results in a requirement for replacement. Attrition means permanent losses of teachers from the teaching profession. It is the movement of employees out of the organisation or institution. Understanding the extent helps to plan for teacher supply. Any analysis of teacher demand and supply needs a consideration of possible workplaces and labour market (Ntim, 2013). For instance, possible dissatisfaction with the workplace can be a critical pulling factor for teachers to seek alternative opportunities. Therefore, the more teachers see other alternative opportunities the less willing they might be to face frustrations in their work.

The challenges of teacher supply are great in sub-Saharan Africa. The rapid expansion of enrolment has increased the need for teachers. The

expansion in enrolment has stimulated a changing geographical requirement for more teachers in rural schools (Volunteers Serving Overseas -VSO, 2004). The fast growing education system of Sub-Saharan Africa has experienced a drastic imbalance of teacher supply and demand. For instance, in Lesotho in 2007 study indicated percent of primary school teachers were unqualified Shortage of teachers results in an inability to deploy teachers to the most remote schools, where unqualified teachers are used to fill the gaps. This tends to be unevenly deployed with more unqualified teachers in the least desired locations. Similarly, rural Tanzanian primary schools also generally have relatively less qualified and experienced teachers (Bennell & Mukyanuzi, 2005).

The reasons for attrition can be categorised into four groups: a) Demographic, (which includes *retirement age, and age profile of the teaching force)*. b) Personal factors *(*such as *marriage, family responsibilities, and illness)*. c) Pull factors: alternative employment (labour market conditions, relative pay of teachers, and relative pay progress of teachers). d) Push factors: (*conditions of schools, living conditions, management with schools, management with education sector, poor school climate, low job satisfaction)* (Mulkeen & Crowe-Taft, 2010).

Studies have revealed that a large number of beginning teachers are leaving the profession, particularly in their first five years of professional practice due to lack of support (induction or mentoring) (Darling Hammond, 1999). Beginning teachers have immense responsibilities, and they are struggling on their own to get into the profession (Bhalalusesa et al., 2011).

The reasons for attrition rates for beginning teachers in Tanzania are not well established or explicitly indicated in the national data statistics. However, the basic education statistics in Tanzania - BEST has indicated causes for attrition, which seems to be similar to data obtained by other researchers around the world. In 2010 data indicated that 17.5 percent of teachers working in Tanzania left the profession and secured employment elsewhere. This is an indication of not being satisfied with the teaching profession (URT, 2010). Mulkeen (2008) in his study of sub-Saharan

Africa (Tanzania, Malawi Lesoto and Mozambique) also revealed that teacher attrition rates are contributed to by the unsatisfactory of teachers' living and working conditions as well as low salaries.

Drawing from the 2010-2012 teachers' attrition data from Tanzania, the need for induction and professional development is crucial. Mentoring processes could be one way that as the mentoring experience has been rewarding to teachers. Noticeable experience also may be obtained from the EQUIP program in Shinyanga, where a school-based teacher mentoring system serves for both new career teachers and the on job primary school teachers (Sedere et al., 2008).

In conclusion, working with and managing large class sizes, teaching instructions, and socio-cultural factors which enable cooperation with parents and communities towards education have been explained as critical gaps. Teacher education, schools and supervisors have to agree on how best to support teachers to avoid professional burnout and leaving the profession.

3.2.2 Learners' perspective

In this section the focus is on learners' dropout, the socio-economic status of the families, and level of parent involvement. Learners' classroom experiences can be shaped by the school context and the allocation of resources.

Dropout of school: Despite a vast empirical literature on school dropouts in both developed and developing countries (Thomas et al., 2002) the mechanisms leading to early dropout in developing countries has not been the focus of research. Besides the benefits of education in developing countries, early dropouts are a widespread phenomenon. School enrolment and completion are functions of demand, supply and government policy. 'Demand' refers to the question of how individual decisions are made by the learners or their parents on schooling. The benefits of education are from a family perspective related to the direct costs, to the real benefits of staying at school, to further opportunities and to calculated future income.

With regard to the causes of some parents not sending their children to school, the reasons can be demand for education and supply of education services. Other factors identified that are directly affecting girls education in particular are increasing levels of enrolment, delayed school entry, repetition and low school performance and pregnancies. Patron (2008) pointed out factors of 'poor' quality of education, 'poor' subject performance, low aspiration, and low interest in early school days.

In Tanzanian primary schools the main reasons for dropout include truancy, early marriages and pregnancies, nomadic life, or families and parental attitudes towards education associated with the economic status of families (URT, 2011; 2012). For instance, in 2012 data from BEST indicated that the main cause of dropout is truancy at 75.5 percent, followed by others (not specified) 13.3 percent, unable to meet basic needs by 5.4 percent, death 3 percent, illness, 1.5 percent, pregnancy and taking care of ill people, 0.9 percent, (URT, 2012). A study by REPOA (2010) reveals that for every five children, one does not attend primary school at all. The reasons are almost similar to those mentioned earlier.

Unable to meet education basic needs: Inability of families to meet the direct costs associated with education is growing in developing countries (REPOA, 2010). This means parental contributions to education seem to be higher than what the government is paying. The direct expenses supplied by the parents are school fees in some countries, uniform and transport costs, which contribute to a great deal of dropouts. For instance, about 4.4 percent in 2008 and 6.0 percent in 2011 of the dropouts in Tanzania comprised lack of school needs such as uniforms, exercise books, and other contributions for school development (URT, 2008; 2011).

Early marriages and pregnancies constrain girls' schooling in Tanzania (URT, 2011), as well as causing dropouts in primary schools in the developing countries. In 2008, for instance, 4.6 percent of the dropouts in Tanzania were made up of pregnancies (URT, 2008). However, the situation has been improving for the better, and in 2011 only 1.4 percent dropped out of school because of pregnancy (URT, 2011). Lack of social and economic opportunities for girls also places them at risk of early

marriages and pregnancy. It is a major factor for girls not enrolled in schools and also a reason for leaving school.

Despite the introduction of free primary education in Kenya, girls still find themselves out of school because of early marriage (Mwangi, 2004). Early pregnancies in developing countries are strongly associated with low economic status of the families. Those girls with low school performance are more likely to become pregnant than high performing ones and drop out from schooling.

Repetition rate: In most primary schools in Tanzania, huge increased rates in standard 1 resulted in overcrowded schools, and learners repeating years, particularly in the lower forms (Okkolin, 2013). In fact, repetition and excess enrolment affected all educational resources. According to studies on educational patterns, factors such as poverty and financial constraints, lack of teaching and learning resources, lack of qualified and competent teachers and parental attitudes are key factors behind repetition and dropout. Repetition contributes to high dropout rates in developing countries. This may occur because teachers fail to meet and support all learners in large classes with poor performance. From the national Basic Education Statistics in Tanzania (BEST), the number of repeaters is much higher in lower grades compared to higher grades (URT, 2012). Table 3 shows that the number of repeaters gradually drops as learners move to higher classes.

Table 2. Repeaters by sex and grade in government and non-government primary schools in Tanzania in 2012

Sex	Grade/Standard							Grand Total
	1	11	111	1V	V	V1	V11	
M	47785	27622	19783	13869	454	474	14	113366
F	47747	24329	17810	13076	397	428	15	103802
Total	98897	51951	37593	26945	851	902	29	217168

Source: MoEVT, Basic education statistics in Tanzania, 2012.

The big difference may be due to the overcrowding in lower classes, and to the lack of competence of teachers to teach in lower classes, which has many implications for learners' achievements at lower grades. Learners lack individual assistance and support in becoming familiarised with school and the learning environments, and thus lag behind.

The impact of gender inequality: Gender is explained as a system of social practices creating difference and inequality between males and females (boys and girls) according to the United Nation Development Program (UNDP), 2005. Gender inequality is expressed as unequal opportunity and life chances that have a direct effect on people's life and activities. Gender inequality is also perceived as a set of social forces conducting an unconscious practice of power over people, and as a different replacement and rewarding of women and men.

Access to education for girls and women in sub-Saharan Africa is still a major challenge. Traditionally, women have been blocked from progressing; they have been deprived of education money, property, and advancement in comparison to men. In Tanzania the educational outcomes of girls and women are lower than those of boys and men (Okkolin, 2013). This is significantly evident when moving to the higher level of education (advanced and universities). For instance, in 2006, 49 percent of students enrolled in primary schools were girls, 47.5 percent in the first year of secondary education were female, 40.5 percent enrolled at advanced level were female and 30 percent of master degree students were females, and only 2 percent people enrolled in higher doctoral degree programs in 2006. From the presented figures, there is an evident declining pattern regarding female student access to education.

It has also been noticeable in South Africa that women and girls' (minority) rights to access to education is still a major challenge (Leer, Suedeker & Koszorus, 2010). This has been due to race, sex, class and religious biases, amongst others. As a result, women's rights have been enshrined in policies regarding domestic violence, frameworks and employment, to mention but a few. Due to these kinds of factors, women and girls continue to be oppressed and side-lined in different spheres of society.

Culture and norms often discriminate against girls, leading to exclusion from authority and succession. When education costs exceed the family income, girls are denied schooling (Sharma, 2003). In such a case, boys may be the priority when deciding which child should be enrolled and supported in school. Moreover, due to the unequal socio-economic gender constructs in most African societies, the level of disadvantages is tipped against girls and women. In developing countries and Tanzania in particular, poverty affects more girls from poor families because of school contributions (Businge, 2010; Kisslinger, 2006).

Traditionally, girls are prevented from progressing and their role seems to be as family caretakers and they are thus deprived of education. There are many reasons causing concern about gender inequality in schools, most of which are related to cultural practices, for instance the direct costs of education parents have to meet, early marriage and school environment (UNICEF, 2005). Other factors are the low expectation of teachers regarding girls' intellectual abilities, coupled with low level of feedback, girls' low expectation of themselves, and lack of role models.

In addition, the labour market in poor countries is overwhelmingly preventing the majority (girls) from attending school (Offorman, 2009). The division of labour at the level of household can sharply affect the relative chances for girls and boys attending school. Research suggests that much of girls' time, as opposed to boys', is spent helping their families. The opportunity costs of girls' schooling may be greater. Poverty is one of the main reasons for girls not attending schools in developing countries.

3.2.3 Parental involvement

What is the role of parents in the education of their children? The home is the child's first school since more time is taken up there than used at school. Parents' involvement in their children's learning is essential for academic success (Martin, 2007). Parents who provide structure, support, and guidance to their children are more successful than parents who do not give this kind of support.

The work of Martin (2007) reveals that parents who are involved in school development enable their children to achieve higher grades and improve attendance, because education gives them higher chances of progressing socially and economically. Involvement of parents with school development contributes to controlling unwanted behaviours like absenteeism.

Lack of parental attention to school causes children to develop permanent unwanted behaviours. There are several reasons for parents not being involved, such as lack of time, low education level, and lack of information about the school (Martin 2007). Thus, parents need knowledge and encouragement in order to deepen their understanding of the importance of participating in school development for their children. Schools have a great role in influencing and encouraging parents to get involved. If parents are kept informed, they feel like partners with the schools and tend to be involved in their children's education.

4 Pre-service and in-service teacher education

In this chapter I focus on two broad phenomena: pre-service teacher education and in-service teacher education. The concepts of subject matter knowledge, pedagogical knowledge and pedagogical content knowledge as key phenomena for teachers are presented and analyzed. Possible limiting and enabling factors regarding professional development for teachers and actions for improvement in EQUIP are also discussed. However, EQUIP in particular is incorporated in order to contextualize the analysis.

4.1 Teacher education

Teacher education is a complex and demanding enterprise due to rapid social, economic and technological changes. Through teacher education student teachers are enabled to acquire knowledge, attitudes, behaviours and skills that can be summarized as pedagogical knowledge and content knowledge (Lukanga 2012). Well-qualified teachers are an important determinant of learners' achievement. Teachers' education ability and experience account for more variation in learners than all other factors, thus, knowing the subject matter, understanding how learners learn and applying interactive teaching methods have greater effects on learners' achievements.

4.1.1 Pre-Service teacher education

During the initial stage of teacher qualification student teachers start to develop knowledge and attitudes, form habits and ways of thinking about the profession (Feiman-Nemser, 2001). They need to acquire skills not just about how to teach but rather how to teach a specific content. Being specific and directed to content will enable them learn and adapt appropriate teaching methods. In Tanzania, two types of teacher education programs are offered, namely college-based, this is the Grade 'A' teaching certificate course and the Diploma course for secondary

education (Lukanga, 2012; URT, 2001). The minimum entry qualification for grade 'A' certificate teachers is a successful pass at ordinary level secondary education (see Figure 1). Those who pass can join teacher education courses and graduate and be recruited as grade 'A' teachers for primary schools (URT, 2001). Diploma teacher education involves those who proceed to higher level secondary education.

Teachers highly influence the process of teaching and learning (Hattie, 2009). The duration of teacher preparation in Tanzania is another important element for qualifying teachers, both primary and secondary. The duration is two years full time (Lukanga, 2012, MoEVT, 1995). Within this period pre-service teachers are expected to graduate as competent teachers in teaching subjects in primary and secondary schools in Tanzania (Bhalalusesa, et al., 2011). The National Examination Council of Tanzania (NECTA) credits both certificate and diploma teacher education (MoEVT, 2008).

The curriculum content: As in other countries' systems, teacher education comprises both an academic part, focusing on subject content and a pedagogical part, referring to pedagogical knowledge and pedagogical content knowledge (Lukanga, 2012; Shulman, 1986). During these two years student teachers in Tanzania are taught both subject matter content and pedagogical content. The academic components improve content knowledge of their subjects. The pedagogical knowledge prepares teachers in the skills they need for teaching, while the pedagogical content knowledge is aimed at qualifying student teachers to teach different school subjects.

Teaching practice: Teaching practices are field experiences referred to as block teaching practice periods (in the Tanzanian context) (Lukanga, 2012). During initial teacher preparation, applying knowledge in practice is essential for the teaching profession. The assumption is that teaching practice will make student teachers grow and develop pedagogical knowledge and pedagogical content knowledge. Student teachers go on teaching practice for four to eight or more weeks depending on the availability of funding.

Student teachers are expected to demonstrate sound subject matter knowledge, pedagogical knowledge and pedagogical content knowledge, meaning putting theory into practice through teaching. Opportunities to observe and practice a range of teaching methods in classrooms play a significant role. In teaching practice the challenge is to integrate and balance subject matter knowledge and pedagogical knowledge with the core curriculum.

4.1.2 Global trend, level and duration of teacher education programs

Globally, there is wide variation in the nature of teacher education programs and time spent in colleges. One dominant trend today is the establishment of research-based approaches for teacher education. The research based approach is well-established in the European and Nordic countries and especially in Finland. It is a system of teacher education in which research has been integrated as an organizing idea for improving the quality of teacher education (Kansanen, Tirri, Meri, Krokfors, Husu & Jyrhämä, 2000).

My discussion is based on the Nordic countries and focusing on Finland as a case study. Finland has been chosen because is among the countries which have well-established research-based education (Rasmussen & Dorf, 2001). A research-based approach is taken as an appropriate platform for improving the quality of teacher education in the country. Finland has integrated research studies in teacher education and writing a Master's thesis is a requirement for primary school teacher education. Through the research orientation of the studies student teachers become familiar with the scientific tools that will enable them carry out empirical studies (Westbury, Hansén, Kansanen & Björkqvist, 2005). Making teacher education a university-based program means making educational science and research important in programs of teacher education (Eklund, 2010). The assumption is that university-based teacher education prepares teachers who are scientifically oriented and well-equipped to meet the challenges of a fast changing world.

Student teachers spend at least five years in teacher education (Aspfors, 2012). Despite teacher education being research-based, it has been argued

that during the transitional phase from teacher education to entering the profession, teachers feel that they are not adequately prepared to meet the demands of the teaching profession (Aspfors, 2012). Therefore a mentor education program has been established in order to support newly qualified teachers.

Since the 1970s teacher education has been integrated into the Finnish university system, which internationally is remarkable (Eklund, 2010). In other Nordic countries such a far-reaching step has not yet been taken. In some of the Nordic countries the main part of primary school teacher education takes place in university colleges and is usually linked to a Bachelor's degree while teacher education for the junior high school and secondary education is provided by universities and linked to a Master's degree.

Duration: As discussed, there is a close relationship between the level and duration taken, because the higher the level of education, the longer time is taken, and vice versa. The duration and time taken for preparation is considered crucial for qualifying quality teachers (Darling-Hammond, Pacheco, Michelli, LePage, Hammerness & Young, 2005). The argument behind this is to develop programs of teacher education whose levels and duration are reasonable enough to ensure the quality of teachers.

For many developing countries, and Tanzania in particular, the duration and time of studies pose a challenge to teacher education at the level of Certificate and Diploma, which last for two years (Komba & Nkumbi, 2008; Lukanga, 2012; URT-Education Training Policy, 1995). As we have learned, even the current academic qualifications are perceived to be of low level (Towse et al., 2002).

4.1.3 Content knowledge, pedagogical knowledge and pedagogical content knowledge

In this section, I want to theoretically, anchor my study in a didactic framework. What is didactics? Weniger and Horton-Kruger, (2000) define it as the study of teaching and learning, the study of instruction. They continue by explaining that instruction goes beyond the interaction of

teaching and learning, since it encompasses distinct factors at complex interrelationships. In German and Norwegian, didactics is commonly used in teacher education when students are taught how to prepare lessons. The term didactics originates from the Geek *didaskein* which meant to teach, to be a teacher, or to educate (Hopmann & Riquarts, 2000). In modern German, didactics is seen as art of or study of teaching. Didactics is normally used in the plural

Since the sixteenth century, didactics has been the most important tool for planning, performing and thinking about teaching in most of northern and central Europe. In supporting the argument, Hopmann and Riquarts (2000) argue that it is impossible to understand German, Nordic, and central European schooling without appreciating the role and impact of didactics. However, didactics does not have comparable importance in the English speaking countries, where the issues didactics addresses are presented in a different framework of *curriculum and methods* or *curriculum and instruction*. In that view, it is difficult to translate didactic conceptions and theories into English, not because of language differences, but also because of cultural differences in understanding of teaching, schooling and the teaching profession.

The question posed by Hopmann and Riquarts (2000) *'why then start a dialogue?* Is valid as both traditions can offer or complement each other with substantial insight and knowledge, especially in those areas where each tradition has its own shortcomings. In addition, curriculum theory has taught the didactic traditions important lessons on the relation of school and society, on the nature and scope of educational planning and on other related issues concerning teaching and schooling. In future, the didactic tradition can support the recent move of curriculum theory towards issues of reflective teaching, curriculum implementation, and teacher thinking on developed knowledge about presented issues.

However, instead of using the continental European approach of conceptualizing didactics, I have chosen Shuman's (1986) concepts of shaping the process of teaching and learning. For my purposes Shulman's three categories *content knowledge*, *pedagogical knowledge* and *pedagogical content knowledge*, capture and encompass the broad

principles, strategies and organisation that appear to form an essential part of the teacher's competence. The three categories will be discussed and examined separately and show their relationships as illustrated in Figure 3 in following sections.
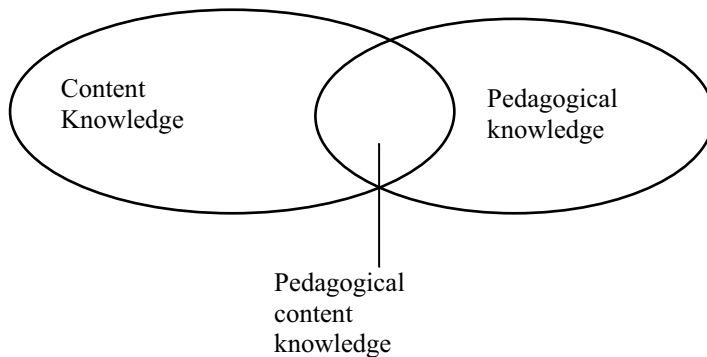
Figure 3. Relationships between content knowledge, pedagogical knowledge and pedagogical content knowledge: adapted from Shulman (1986, p. 9)

Content knowledge: As has been touched upon in the previous sections, content knowledge plays a key role in the teacher's work. It is referred to as a body of information that teachers teach and learners are expected to learn in a particular subject. It includes organizing principles and central concepts of the subject and their relationships. Consequently, teachers having adequate content knowledge are not only able choose appropriate ways to represent the content but also ask questions, plan activities and facilitate discussions (Shulman, 1986), they can also promote learners' prior understanding of a particular topic to establish new knowledge.

Subject Content knowledge can affect what teachers teach, how they teach, the knowledge that learners have to acquire through the curriculum and their ability to use the acquired knowledge and skills as tools to overcome every day real world problems (Ball & Bass, 2000). As Shulman (1986) argues, teachers should not be obliged to define concepts for learners, but be able to find reasons, explain why things are the way

they are, why it is important to know these things and how they are related to daily life.

Subject matter content knowledge is a central requirement of teaching and has impact on learners' outcomes (Hill, Rowan & Ball 2005). The teachers' actions in the classroom, therefore, are much influenced by what they know about the subject content. For instance, in mathematics, student teachers will learn specific concepts, definitions, conventions and procedures. Understanding of this kind of content, therefore, will enable teachers to choose appropriate teaching methods. But when teachers lack content knowledge, on the one hand, they may misrepresent both the nature of the subject and the content.

On the other hand, they may also fail to construct knowledge and interact with learners. As Conant (1963) in Hill, Rowan and Ball (2005) wrote: 'if a teacher is largely ignorant or uniformed about the content, she/he can do much harm in the classroom. Nonetheless, content knowledge is insufficient for teaching and also pedagogical knowledge is needed (Mayer, 2002). There are potential professional links between content knowledge and pedagogical knowledge which I discuss in the next section.

Pedagogical knowledge: Understanding the term pedagogy will help to understand the notion pedagogical knowledge. Watkins and Mortimore (1999) define pedagogy as the science, art, theory and practice of teaching and learning. Thus, pedagogical knowledge is a kind of knowledge which teachers use to deal with everyday teaching (Koehler, 2011), is knowledge about the processes and practices of teaching and learning, i.e. the knowledge of methods of teaching and learning. In a general view, pedagogical knowledge involves learners' learning, classroom management, lesson development, planning and implementation and learners' assessment. In this viewpoint, Shulman regards pedagogical knowledge as the broad principles and strategies of classroom management and organisations that support teachers deliver the subject content. Teachers therefore, need to master pedagogical knowledge for effective teaching (Shulman, 1987).

Lacking full understanding of the fundamental aspects of pedagogical knowledge hinders successful teaching. Gibbs and Coffey (2004), for example, examined the impact of educating university lecturers on methods to teaching, teaching skills and approaches to teaching their students. The results revealed that teaching skills improved significantly. Teachers became less teacher-centred and more learner-centred. Similarly, in EQUIP schools the value added after pedagogical training has contained a variety of activities and practices in which teachers became involved and broadened their pedagogical knowledge (Galabawa & Ndibalema, 2005). Teachers were exposed to various teaching methods, principles and theories of learning. However, teaching large classes is still a challenge (Hamilton et al., 2010).

Koehler (2011) argues that teachers with deep pedagogical knowledge know their learners, and how they construct knowledge and acquire skills. Gibbs and Coffey (2004) further assert that in countries such as Norway, the UK and Sri-Lanka, pedagogical knowledge in universities is compulsory, assuming that teachers will make a difference in the classes.

Pedagogical content knowledge: Shulman introduced the idea of pedagogical content knowledge, which received widespread attention in 1985. Shulman (1986) described pedagogical content knowledge as: *The most useful forms of representation of those ideas, the most powerful analogies, illustrations, and demonstrations-in a word, the most useful ways of representing and formulating the subject that make it comprehensible to others.* Pedagogical content knowledge includes an *understanding of what makes the learning of specific topic easy or difficult: the conceptions and pre-conceptions that students of different ages and backgrounds bring with them to the learning of the most frequently taught topics and lesson*s (Shulman, 1986 p.7).

Based on Shulman's (1986) definition, different researchers have expressed and defined pedagogical content knowledge in different ways. Ball and Bass (2000) express it as a special form of knowledge-bundled subject matter knowledge of the learners' learning and pedagogy. According to Mullock (2006), pedagogical content knowledge is accumulated knowledge about the act of teaching, including the goals,

procedures, and strategies that form the basis of what teachers do in the classroom, i.e. the ability to understand and transform or translate the central topics, skills and attitudes in teaching.

According to Marks (1990), pedagogical content knowledge represents a class of knowledge that is central to teachers' work, which would not be held by non-teaching subject matter experts or by teachers who know little of the subject matter content. As Bilash (2009) claims, pedagogical content knowledge is grounded in the belief and practice of the individual teacher. It includes a repertoire of varied techniques or activities (which meet different learning styles), knowledge of techniques for assessing and evaluating, and knowledge of varied resources that can be easy accessed for use in the classroom.

Pedagogical content knowledge is unique and based on the way that teachers relate pedagogical knowledge (i.e. what they know about teaching) to their subject matter knowledge (content knowledge) -what they know about what they teach in the school context for the teaching of specific learners (Shulman, 1986). What a teacher knows about teaching includes teaching methods, the use of concrete examples and manipulatives, formative testing, use of questions, design of assignments, and assessment of learners' performance. From that perspective, the interaction of teachers' pedagogical knowledge and their subject matter content knowledge comprises pedagogical content knowledge.

What is unique about the teaching process? The uniqueness requires teachers to transform their subject content knowledge for the purpose of teaching (Shulman, 1986). Shulman further asserts that the transformation occurs as the teacher critically reflects on and interprets the subject matter, and finds various ways to represent the information as analogies, examples, problems, demonstrations and classroom activities. The teachers then adapt the material to the learners' abilities, gender, prior knowledge and misconceptions and finally customise the materials to those specific learners who will be taught.

A study by Kitta (2004) on secondary school teachers of mathematics in Tanzania revealed that teachers indicated topics in the syllabus that they

perceived as difficult to teach and therefore needed further support. From that point of view, it suggests the need for professional development for teachers in subject matter knowledge, pedagogical and pedagogical content knowledge.

Another study conducted in South Africa by Howie (2005) analyzed the performance of 900 learners of grade 8 in mathematics. The results discovered that the majority of the learners were below average. Various reasons were suggested as contributing to the low achievement, such as unqualified teachers, poor mastery of the subject and lack of pedagogical knowledge to teach in large classes.

Hashweh (2005) acknowledges that pedagogical content knowledge is rooted in the teacher's every day work and is built up by teachers overtime as they teach the same topics to learners. Pedagogical content knowledge does not exist on its own, but rather blends between content knowledge and pedagogical knowledge (see Figure 5). Applying pedagogical content knowledge in practice is essential (Lukanga, 2012). The starting point is analyzing the subject matter content of the teacher education curriculum.

Likewise in EQUIP, teachers analyzed the subject curriculum (syllabuses) of all subjects. In so doing, they were able to identify difficult topics (content) to teach. To assist teachers with the above mentioned challenges, teacher educators from teacher colleges developed training modules which guided teachers (see Figure 2). The courses provided analytical tools for examining teacher's cognition and its transformation in teaching. In this regard, teacher education in Tanzania has to identify the important pedagogical content knowledge elements needed for teaching, the methods to deliver the content, and how the knowledge is learnt in the classroom.

4.2 In-service teacher education

As introduced in Chapter two, I further discuss EQUIP's professional development model proceeding from the broad overview in (2.2). I have used the terms *professional development* synonymously with *in-service education*.

No matter how effective initial teacher education is, professional development is essential for improving teachers' work in order to cope with ongoing societal changes and education reforms (Feiman-Nemser, 2001). In-service teacher education is a means of equipping teachers with new knowledge and skills for their work. Through professional development programs, teachers share experiences about subject matter knowledge, pedagogical knowledge and pedagogical content knowledge.

For a long time, professional development for primary school teachers in Tanzania has been a policy agenda. The Education Training Policy of 1995 (now under review) emphasises that in-service training and re-training of teachers need to be compulsory in order to ensure teacher quality and professionalism (URT, 1995). Unfortunately, this policy has so far not been implemented.

Teachers' professional development constitutes an important element for quality teaching. The provision of in-service teacher education is intended to improve classroom practices. This can be a long-term or a short term process, including regular opportunities for training in teachers' professional knowledge. It is assumed that in-service education for teachers plays a great role in the improvement of quality of teaching and of education in general.

The degree of professional development to which teachers are exposed is strongly linked to both inquiry-based teaching practice and to an investigative classroom culture. A study by Supovitz, Mayer and Kahle (2000) found that because of teachers' participation in intensive professional development activities, their attitudes towards preparation and practices all showed strong positive and significant growth.

Despite the professional development programs provided in Tanzania, teaching is continuously considered to be of poor quality (Hardman et al., 2012). Most professional development courses take place in the form of seminars and workshops, which have also been criticized for not having a significant impact on teachers' work (MoEVT & the Open University of Tanzania - OUT, 2007). This means that teachers have poor knowledge of the subject matter content, and of pedagogical and pedagogical content knowledge. Courses are often not well-formalised and where they exist, are found to be of an ad hoc nature and mainly concentrated on urban areas (Komba & Nkumbi, 2008). So far, the education sector has received little political will and societal attention and been allocated little funding (Kitta, 2004).

UNICEF in 2009 conducted a survey mapping in Tanzania on existing teacher education-related policies, structures, plans and activities. This informed the development of in-service training education and professional development strategy (MoEVT, 2009). The professional development strategy was officially launched in February 2011 (Hardman, et al., 2012).

4.2.1 Factors influencing demands for professional development

Several reasons are put forward to explain the demand for the professional development of teachers. These can be explained as teacher under-qualification, low subject matter knowledge, inadequate pedagogical knowledge, inadequate pedagogical content knowledge, lack of educational orientation and lack of induction for newly employed teachers (Chediel, 2010; Wedgwood, 2007). Two factors are discussed further because of their impact on teachers' work.

Teacher under-qualification: The number of under-qualified teachers in Tanzania remains a challenge in terms of quality of teaching and learning outcomes (Komba & Nkumbi, 2008; Wedgwood, 2007). As discussed in 2.2.1, short-term (two-tier) programs for both primary and secondary education teachers were established due to the huge enrolment rate and subsequent demand for more teachers. This has brought about variation in

the preparation of teachers in terms of expertise and experience, as well as the academic and of professional requirements.

Despite the variations in qualifications, many teachers were recruited. Teachers employed during this period many suffer from inadequate subject matter knowledge, pedagogical knowledge and pedagogical content knowledge (Chediel, 2010). There has also been much criticism about the short program of preparing teachers (Galabawa, Senkoro & Lwaitama, 2000; Mosha, 2006).

Low subject matter (content knowledge: Professional development is intended to improve teacher quality, effectiveness in the classroom and learner (Mhando, Mtavangu & Mtana, 2010). Most student teachers in short programs join teacher education after finishing only primary education and lower secondary education, (see Figure 1).

4.2.2 EQUIP's professional development model

As highlighted in 2.4, EQUIP was a five year program started in 2003 and successfully ended in 2008. In 2003, a program for educating teachers was developed, which included 4 key areas (see Figure 6). After the five years of implementation and the evaluation in 2008, EQUIP was extended to another three years (2009-2012) for consolidating and finalising implementation in areas that were not well achieved.

The EQUIP program in Shinyanga, in essence, as implemented in other countries like Ethiopia and Rwanda, strives to raise the quality of primary education through various ways. The ways could be through *school-based* and cluster-based *in-service program*[7], supported by bringing learning resources closer to schools (Hamilton, et al., 2010; Sedere et al., 2008).

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[7] The term is commonly used in Tanzania and means the provision of professional development programs or programs? Are you using Br or Am English? You need to apply the style consistently all the way through to practicing teachers. The term has been used interchangeably with other terms such as continuous professional development and further professional development. They all refer to additional training, courses, workshops that teachers get after their initial preparation to improve their work.

Learning resources include mainly teacher resource centres and school libraries. The use of school-based in-service courses is a potential way of improving subject matter knowledge, pedagogical knowledge and pedagogical content knowledge practices as opposed to theory and raising the quality of teaching and learning in the project primary schools.

Prior to EQUIP, the majority of teachers in Shinyanga never received any kind of professional development (Orodho, 2005). As discussed previously, the essence of EQUIP lies in the improvement of subject matter knowledge, pedagogical knowledge and pedagogical content knowledge, and the assumption is that focusing on this kind of knowledge intervention will raise the learners' achievement and increase community support for education.

EQUIP can be considered as a kind of a breakaway from traditional to interactive teaching (Sedere et al., 2008). Teacher-centred teaching is concerned with the teacher being the only source of knowledge (Borich, 2007). The teacher controls the learning environment, and lecturing is the core form of teaching. Decision making about curriculum content and specific outcomes depends on the teacher. Traditional teachers believe that it is the teacher who causes learning to occur. Subject matter content and delivery are considered to be the most important and learners master knowledge through drill, practice, and memorization. To ensure teachers get away from traditional teaching, a continuous in-service program was designed and implemented, focusing on improving subject matter knowledge, pedagogical knowledge and pedagogical content knowledge.

The quality of education depends on the quality of the education provided, which in turn depends on the quality of teachers, and so it is essential to enhance the teacher's knowledge of the subject matter and pedagogy. In EQUIP, courses were designed to promote a learner-centred learning environment and the use of active inquiry-based methods (Hamilton, et al., 2010). The focus was on the interaction between the teacher and the learner and the content. This relation refers to the teacher's different positions in interaction, the teacher, learner and content relationships (didactics) that involve teachers' actions in their daily

classroom work (see also Westbury, Hansén, Kansanen & Björkqvist, 2005).

The course included the teachers' ability to utilise theory about teaching and learning processes, as well as generating ideas and materials for further development of their work. Curriculum analysis practices were done (see Figure 6) according to the cascade approach. Education workshops were organized to empower teachers by providing the required pedagogical content knowledge, and how to represent the subject content knowledge using appropriate teaching methods (cf. Silverman, 2006). A range of teaching methods were introduced and practiced by the teachers. The teachers performed the classroom related activities of preparing lesson plans and marking learners' homework.

During the courses, the teachers were encouraged to view themselves as facilitators in the learning process. They were advised to begin their lessons with the learners' prior understanding of the subject; that is, the knowledge the learners have in relation to the content of the subject. Due to curriculum reform moving towards education being competence-based (Meena, 2009), this also made it necessary for EQUIP to emphasise subject matter knowledge, pedagogical knowledge and pedagogical content knowledge.

To deal with the problem of the teachers' low level of pedagogical knowledge, EQUIP introduced various teaching methods that were thought to be appropriate and relevant to promote learner-centred learning, also classroom organisation. These included small group discussion; jigsaw; think, pair, and share; what I know, what I want to learn and what I have learned; question and answering; and demonstration and experiment methods (Mtana, Msimbe & Kauky, 2003). In each method, the teachers explained and demonstrated what works and the limitations, if any, to a learner-centred approach.

The intervention was only an entry point to generate a process of change in school and classroom culture to shift from traditional teacher-centred teaching to child-centred learning. Emphasis was placed on how to manage large classes. Teachers can take up the challenges of teaching but

sometimes may not be able to develop the needed knowledge. EQUIP has made long strides in transforming the nature of teachers' work through professional development (Kitta & Komba, 2012). Various courses were designed to conceptualize the model as shown in Figure 2.

In 2008, EQUIP was evaluated in order to get a view of its impact towards improving quality teaching and learners' outcomes. The results reported the challenges of large classes, inadequate teaching and learning materials, and inadequate teachers were critical constraints to their work. On the positive side, the evaluation report revealed that EQUIP has managed to bring about a significant change. Among improvements, a shift in school and classroom culture towards a more learner-centred approach, a more appropriate use of learning materials and more independently acting teachers can be mentioned. Still, some teachers showed a lack of ability to use available resources, but the dominant picture clearly revealed a strong process of capacity building in this respect among teachers.

Since 2013, the government of Tanzania, in collaboration together with the Department for International Development (DFID), launched a four year Education Quality Improvement Program in Tanzania (EQUIP-T), aiming at improving the quality of primary education, especially for girls. Seven regions which were relatively educationally disadvantaged, Dodoma, Kigoma, Lindi, Mara, Shinyanga, Simiyu and Tabora were selected. The main focus is on enhancing teachers' performance; enhancing school leadership, strengthening district management, strengthening community participation and strengthening learning and dissemination of results.

4.2.3 Conceptualization of the EQUIP model

Given the fact that Shinyanga region was seen to be unsuccessful in all educational performance quality indicators and resources parameters (Galabawa & Alphonse, 2005) the pedagogical development of teachers was crucial. A baseline study by Orodho (2005) in Shinyanga district indicated that many teachers in primary schools within the project area commonly applied learning by rote approaches. As discussed in the

introduction, learning by rote methods, suggests poor pedagogical and pedagogical content knowledge implementation by the teachers. From the reasons pointed out, it was important for the EQUIP project to start implementing professional development programs in order to improve primary school teachers' classroom practices in the project area schools. However, Shulman (1987) argues that teachers are supposed to understand deeply not only the subject matter content they teach but also *how* to teach or represent the pedagogical content knowledge to all learners.

In order to achieve change in teachers' practices and the factors that enable better learning, a model for capacity development for in-service education and mentoring was developed. Four key aspects to support teachers' professional development were identified, as illustrated in Figure 4. In the diagram **L**- Learner; **T-**Teacher; A: 1, 2, 3, 4 are aspects of the model.

A 4

Supporting
learner-centred
learning

A 3

Improved
learning

Improved
Teaching

T

Dealing
with
mediating
factors for
good
learning

T   L   T

Supporting
good learning
environment

A1

T

Improved
Governance

Improved
Environment

Supporting
good school
governance

A 2
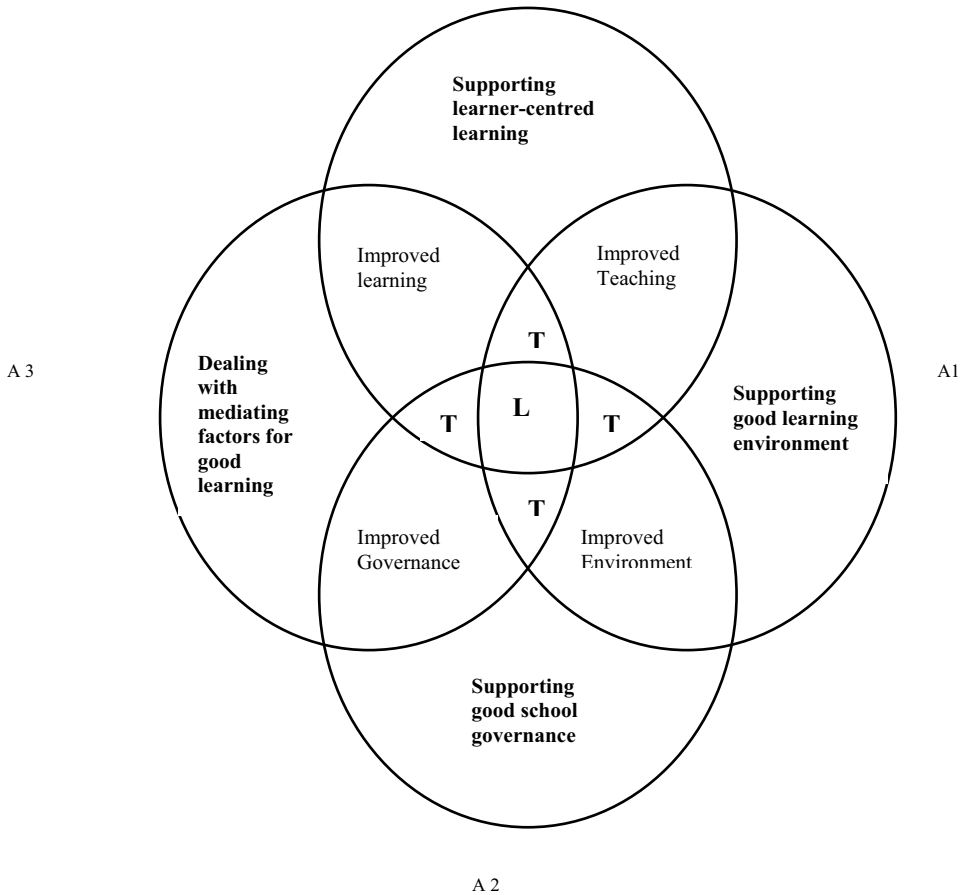
Figure 4. Conceptualization of the EQUIP model: Adapted and modified from Oxfam's grant application form (2003) to European Commission-un publish

In Figure 4, the EQUIP model indicates four major aspects. The reasons for selection of the aspects will be dealt with under each aspect. I have used the concept '*good*' to refer to high quality of the phenomenon produced. In this context, then, quality refers to developed and improved value of phenomena (*teaching, environment, governance and learning).* Based on these aspects, EQUIP can be seen as a relevant project to demonstrate quality teaching in primary schools in the project area and in Tanzania at large (Hamilton, et al., 2010; Sedere, et al., 2008).

Aspect one: *supporting learner-centred learning:* This aspect was mainly for educating teachers' facilitators (who were among the selected teachers and the district officials). Its composition consisted of teachers, ward education coordinators, inspectors of schools, mentors, teacher resource coordinators, and district education officials (Orodho, 2005) (see Figure 2).

In order to ensure continuous teacher development, the district established and educated district resource pool of facilitators for teachers (Figure 5). The establishment of the resource pool was a major factor for liberation of teachers in the project area. There have been a number of empowering workshops for the facilitators based on the immediate needs (Figure 6). The short courses aimed at introducing teacher facilitators to subject matter knowledge, pedagogical knowledge and pedagogical content knowledge in order to enhance teaching (Sedere et al., 2008).

Aspect two: *supporting a good learning environment:* The aim was to improve teaching and learning resources. The major activities were construction and renovation of teacher resource centres and school libraries. The assumption was that these resources would enable teachers develop and improve both pedagogical knowledge and subject matter content knowledge (Hamilton et al., 2010). Ten teacher resource centres in the cluster and two at district level were constructed and resourced. Apart from resource centres, 32 schools benefited from established libraries.

Aspect three: *supporting good school governance.* The focus was on empowering district education officials to understand, own and support

EQUIP technically and financially. Moreover, EQUIP has supported school governance by educating and mobilizing school committee members, head teachers, ward education coordinators and created a pool of professional mentors. Schools with better and committed teachers have benefited more, while the schools with weaker head teachers have not taken the advantage of such courses given to school committees. Head teachers are often the most critical factor for the success of schools (Sedere, et al., 2008).

Aspect four: *dealing with mediating factors which support good learning:* The provision of a free school lunch, latrines, and rainwater harvesting tanks for some schools created a more conducive environment for learning. EQUIP emphasised improving water in school and sanitation. Fifty-eight schools benefited from rainwater harvesting tanks for safe drinking water and another 60 from latrines and sanitation. As a pilot study, 157 schools enjoyed free school food for 18 months only, because it was donor funded. The assumptions for engaging in these activities were that the government and community would learn and replicate or scale up. It would also improve learning outcomes. The impact of all implemented factors shows a positive result, as attendance and retention were also raised (Hamilton, et al., 2010).

In conclusion, despite the promising achievements, teaching is still teacher driven, but with the intention of involving the learners. This implies that change needs time and continuing practices that would make it possible to enhance knowledge, attitudes and skills. It is understood from the EQUIP project that the courses offered are taken as a tool for improving quality and efficiency in teaching and learning outcomes.

Educating teacher facilitators: Implementation of the EQUIP in-service education began by educating 170 teacher facilitators from the teachers' resource pool. The teacher facilitators were identified by the inspectors of schools in collaboration with the district education officials. The selected facilitators were provided with in-service courses and mentorship. These in turn delivered in-service workshops and school visits within their cluster (Hamilton et al., 2010; Sedere et al., 2008).

The assumption was that training various stakeholders would build a strong social network within schools and between classrooms and communities. The facilitators were educated based on the capacity building need. A number of course sessions were carried out (see Figure 6). Courses for teachers were organized and scheduled according to time available in the year calendar. The model and processes for educating the facilitators of teachers involved 3 steps, as shown in Figure 5.
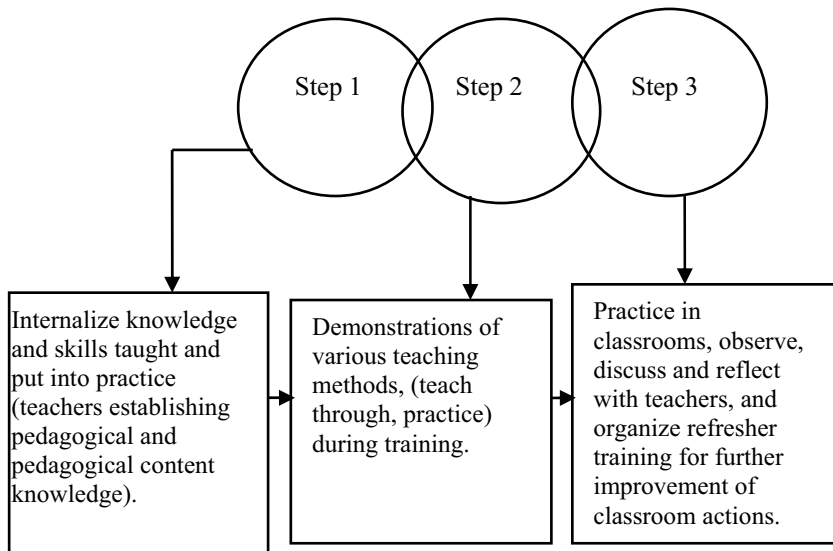
Figure 5. Summarised facilitation model for EQUIP trainers.

The three steps in the diagram have been applied by facilitators during their courses. The steps are influenced by Shulman's (1986; 1987) concept of pedagogical content knowledge. Thus, demonstrations and practice were the mode of capturing knowledge and skills required to increase the quality of teaching. The arrows indicate the direction in which teacher trainers were educated and applied acquired knowledge and skills into practices.

In *step 1:* School-based education was carried out every year, each time addressing a different level of development along with the following: how children learn, curriculum analysis, teacher and learner's motivation,

assessment and evaluation and the use of local environment to prepare teaching and learning materials.

In *step 2:* emphasis was placed on putting theory into practice. Teacher trainers practised the teaching methods they had learned. They were attached to schools to facilitate practice and observe lessons, which helped the trainers understand the real classroom situations. Information gathered through observation helped teacher trainers to reflect on and improve the facilitators' skills.

Step 3: The facilitators' preparation involved working with evidence from the field for enhancing further knowledge and facilitation skills. Information was collected, disseminated and shared with other stakeholders during annual education meetings. During the meetings the EQUIP model for improving education quality was shared and discussed. Through networking teachers not only updated their skills and information, but also prepared to transform their role as teachers, solve their problems, and make their teaching interesting (Sedere et al., 2008).

Most of the teachers in the project schools attempted to adapt themselves to learner-centred education in traditional classrooms settings. There was also a positive change in their pedagogical and pedagogical content knowledge. However, the ability to demonstrate quality learner-centred education to a satisfactory level was not reached in all the EQUIP schools during a five year period.

4.2.4 EQUIP implementation strategy

A cascade model is one strategy widely used to train a large number of teachers in a cost effective way (Hayes, 2000). Those who already have trained (*trainers of trainers*) are then expected to train group of teachers (*facilitators*) who may in turn be able to train other teachers. EQUIP applied the reflective cascade approach to implement its interventions, as defined in 2.4. The approach shows how EQUIP courses seek to involve teachers in managing their own development. Educating teachers through a cascade can promote development, rather than following the government mandate. The adoption of this approach by EQUIP meant to

create space for both teachers and other key stakeholders involved in the implementation of the program to realise problems that teachers encounter in their work and find ways to solve them.

The approach enabled the program implementers to identify course needs for teachers that required intervention. The teacher-facilitators attended courses in organized professional development programs (Newton, 2012). The challenges were realised concerning subject matter knowledge, pedagogical knowledge and pedagogical content knowledge, which included how children learn, curriculum analysis, improvisations in teaching and learning materials, and difficult topics or areas identified by individual teachers (Hamilton et al., 2010). The urgent need for teacher professional development made teacher colleges develop modules based on four course components (see Figure 6).

A reflective cascade approach was designed in order to support teachers to articulate the teaching challenges they faced through reflection and experience sharing during training, seminars and workshops based on their school contexts. This kind of articulation was only possible with the support of reflection processes after each course program and in real practices at their school. The cascade approach also aimed at preparing a resource pool of facilitators who would continue educating teachers even after the end of the EQUIP program.
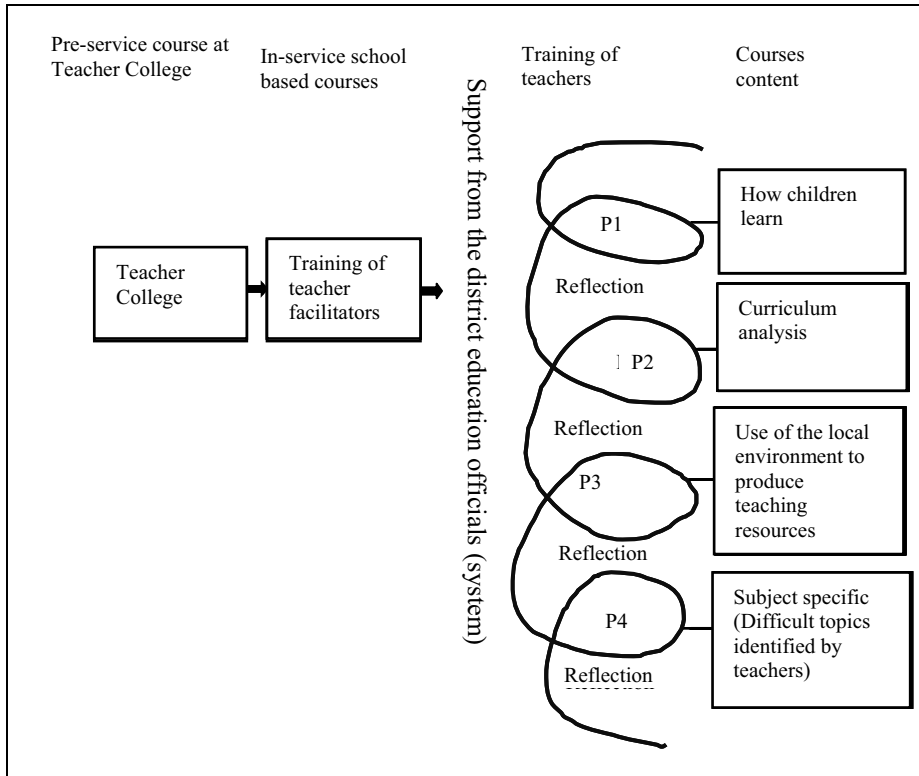
Key: P1, P2, P3 and P4 organized course content.

Figure 6. A reflective cascade approach model for EQUIP's in-service education

In line with the cascade approach as previously defined, the model offers a set of tools that allow teachers to reflect upon their own practices and examine conditions in which they can improve the capacity to increase consciousness and learn more about the fundamental nature of the work they do, by carefully examining their thoughts and feelings in teaching.

Reflection was a core element of the EQUIP model, designed to support teachers in expressing their teaching individually and collectively within their school and classroom context. Reflection in the cascade approach is

regarded as both an individual and collectively practiced activity, where individual teachers assess their progress or examine the ways they teach (Hansén, 1998). Collectively, the facilitators also evaluated their facilitation progress as a team. Referring to Schön (1983), reflection on action means thinking back on what has been done in order to discover gaps that may need further support. Through a cascade approach, teachers were educated to assess their own practice. The reflective cascade approach enabled the creating of space for teachers and facilitators to share experiences, sometimes even to challenge assumptions about teaching.

Cascading allowed flexibility in the EQUIP program as needs arose during the course of implementation of activities. Through reflection a model of developing teachers and other education key actors within the district and at national level was organized. The model was not an end in itself for making changes in teachers, but was also as a useful and beneficial tool for teachers to make changes.

4.3 Summary

In this chapter, I have discussed pre-service and in-service education as developmental processes for developing teachers from initial preparation to full teaching. On the pre-service education, the major focus was on subject matter knowledge, pedagogical knowledge and pedagogical content knowledge as keys for teachers' work. On in-service education discussion, the focus has been on professional development and EQUIP's further professional development. The essence was to highlight how teachers were developed within the EQUIP program model. As we have seen, subject matter knowledge and pedagogical knowledge are embedded together and cannot be separated during teaching in forming pedagogical content knowledge. The content and the methods are crucial in the teaching and learning process. Mastering the subject matter knowledge alone is not sufficient for teachers to be able to deliver the content to the learners, and the opposite is also true.

5 Research questions, methods, empirical data and analysis

In this chapter the research questions, selection of research approach, research design and methods of data collection and analysis used in the study will be presented. I describe how data collection and analysis of the empirical data have been reached. Finally, I discuss validity, reliability, and ethical issues within a phenomenological approach.

5.1 Research questions

The presented research problem, overall aim and theoretical background of the study, as presented in Chapter one provide the scope for formulating specific research questions directed to the empirical data collected. To understand the teachers' experiences of their work (teaching), I posed two research questions: 1. What do teachers experience as constraints to their work? 2. How have teachers improved their classroom actions after undergoing professional development courses?

Teachers applied for the EQUIP program because of the constraints they experienced in their daily work. EQUIP seemed to offer the hope of refreshment in their work (Sedere et al., 2008). In the first question, my ambition was to seek teachers' understanding of the problems they face in teaching and the kind of factors that cause these problems, as presented in Chapter 1. The second question addresses the actions for improvement teachers have taken as solutions to the perceived and experienced constraints. The problems and the development actions of teaching are analyzed from the teachers' experiences. The analysis could be one factor in understanding the classroom actions and set the basis for teachers' professional growth. My ambition was to find out what kind of improved actions teachers experienced after participating in professional development courses.

5.2 A phenomenological approach to teachers' experiences

A qualitative approach was believed to be appropriate for this study because it focuses on deepening understanding of the experiences teachers have in their work (van Manen, 1990) as well as seeking the meaning they attach to these experiences. The approach starts from the perspectives and actions of the respondents under study. It is also concerned with interpreting and understanding phenomena through the meaning that participants attach to them. In a quantitative study, meaning is generated from the researcher's ideas about the dimensions and categories that form the essential part of the study. It seeks causal determination, and generalization. Conversely, qualitative research uses a naturalistic enquiry that seeks to understand phenomena in their context-specific settings (Patton, 2001). For this case, the context specific setting is the schools and the classrooms of the investigating teachers.

The primary school teachers' teaching constraints and their actions for improvement are investigated through a phenomenological approach. This approach examines the lived experience of individuals, which in this case, is teachers' classroom work (Byrne, 2001). The ambition was to focus on the lived experiences of primary school teachers since primary school is the foundation for higher education.

The notion phenomenology can be considered as a philosophy, as well as a methodology (Husserl, 1970). Philosophers in phenomenological studies believe that reality is intentional, that humans direct their consciousness towards objects. Consciousness is the abilities of memories, intentions, and thoughts to make things happen in one's cognitive construction. To others like Gennaro (2008), consciousness is a mental state of being, which one likes from his or her perspective. From a philosophical point of view it is when one is conscious of something (an object perhaps), then, she/he is in relation to it and it means something to her/him.

In this viewpoint, the subject (her/him) and the object are joined together in mutual agreement, and this is what is termed as intentionality (Husserl, 1970). For instance; Moran (2000) uses the notion "aboutness" to

describe the intentionality of conscious experience. This means that the meaning of a phenomenon is not inherent in objects, but is actually located in the individual's inner life. Therefore, as a philosophy phenomenology focuses on studying concrete and lived existence in the world (Dahlberg, Drew & Nyström, 2001). In that viewpoint, then, true knowledge of a phenomenon can be explored only through the lived experience of the respondent's expression (van Manen, 1990). Based on this argumentation, the main concern of phenomenology as a philosophy is to describe a phenomenon from the human lived experience point of view (Husserl, 1970).

The notion phenomenon is a central concept within phenomenology. It has a temporal structure, is about history, it can never be grasped in its immediate presence (van Manen, 1990) but only as reflection of the past. Thus, van Manen defines it as an experience which is lived by a person at a given time and a given place, whereas Dahlberg, Drew and Nyström (2001) refer to an object, a thing or state of being, as it presents itself to, or as it is experienced by a subject. A 'thing' here refers to the world of experience as lived (Husserl, 1970).

Neill (2004) refers experience to the nature of the events someone has undergone. Experience can be described as what is happening all the time to a person, as practical knowledge, skills and practice derived from direct observation of or participation in events or in a particular activity. Specifically, the present phenomena, which are addressed in the two research questions, are teacher constraints and the actions for improvement. Teaching actions in primary education are basis for this study.

Phenomenology as a methodological research approach can be expressed as inductive (Husserl, 1970; Thomas, 2003) as well as descriptive (Giorgi, 1985). In a phenomenological study the focus is on the essence of the explored experience and describing the underlying reasons for it. In this context, essence refers to the decisive elements of an experience and for van Manen (1997) that makes a thing what it is. Thus, it is the true being of things as themselves as opposed to how they are experienced in the life

world. The life world is expressed as the everyday world we live in and all that surround us. It is a world of lived experience.

The experience can be explored through interviews (face to face) (van Manen, 1991, 1997) and it is the most preferable method and emphasised in this approach. Through interviews teachers were able to reflect on their teaching actions by digging deeper into the constraints they had encountered, and reflecting on the changes that had happened because of their personal development in the EQUIP program.

Researchers have been using the phenomenological approach with different perspectives that led to variations. For instance, Ashworth (2003) focused on the life world, van Manen (1991) on lived experiences, Dahlberg, Dahlberg and Nyström (2001) on hermeneutic interpretation. The variations in methods are determined by the research questions and the focus of the study. However, they all share a similar focus in describing the lived experience of phenomena, and on knowledge and understanding as embedded in the everyday world. A phenomenon is regarded as lived experience and not as a problem to solve, but as a question of meaning to be inquired into (van Manen, 1990).

Phenomenological studies aim at gaining a deeper understanding of a phenomenon from those who have concrete lived experience of the phenomenon under study. The primary school teachers in the study area are considered to have concrete lived experience of the studied phenomena. In turn, their descriptions are assumed to be an appropriate source of true knowledge of the teaching constraints and the improved teaching actions in this context.

Patton (1990) asserts that in a phenomenology study, the individual knows what experiences are and what it means for her/him. In this regard, the assumption is that the identified respondents (teachers) know well their experience of classroom work in both positive and the negative perspective and the meaning is embedded.

For this study phenomenology has been taken as an appropriate approach in exploring primary school teachers' experiences of their teaching

constraints and actions taken for improvement after professional development courses offered by EQUIP, as stated in the two research questions (see 5.1).

Interviews are the main recommended instruments for data collection in phenomenological inquiries (Creswell, 2007). When compared to other instruments of data collection, such as observation and video, interviews were desired because they provide descriptions of the respondents' real experiences. In the study I employed observation and video for the aim of validating and enriching the interviews data gathered.

During data analysis and presentation of the empirical findings, I rely on the respondents' own descriptions of their experiences of the teaching constraints and actions for improvement (phenomena) under study, though it is a challenge to draw a clear border line between description and interpretation (Chambulila, 2013). It is important, then, to note that the phenomenological approach pays special treatment to the respondents' descriptions, rather than the researcher's interpretation as is the case in a quantitative study (Dahlberg, Drew & Nyström, 2001).

In phenomenological study the researcher has to avoid making great reductions in the respondents' responses during data interpretation. Based on this argumentation, and worked consciously in presenting empirical data, I made an effort to describe the findings by sticking to the original meaning provided by the respondents as much as possible. To validate this claim, in-depth excerpts from the respondents' statements have been presented in parallel to the descriptions (see Chapter 6) of the results. This practice has resulted in the idea of bracketing (Groenewald, 2004; Karlsson, Johansson, & Lidell, 2006).

Bracketing is an indispensable principle in qualitative research in general, but it is emphasised especially in the phenomenological approach (Dahlberg, Drew & Nyström, 2001). It is the attitude of the researcher in remaining neutral and avoiding establishing early judgment or influencing the respondents in any way based on the researcher pre-understands of the phenomenon studied. Researchers have to control their pre-understanding, which otherwise would mislead understanding of the meaning of the

phenomenon studied. Pre-understanding can be noticeable in the form of theories and assumptions (Dahlberg, Drew & Nystrom, 2001), and also in the form of values, beliefs and experiences.

Giorgi (1977) argues that in order to achieve bracketing, researchers have to maintain what is given by respondents; they have to present it as it is given. It is not the researcher who gives a phenomenon its meaning, but the meaning has to be revealed from the research act. Based on this argument, I attempted to record, transcribe and describe the empirical data by sticking to the respondents' views.

5.3 Context of the study area

As highlighted in chapter 2 the study was carried out in the Shinyanga region in Shinyanga urban and rural district councils (see Figure 7). The region lies between 31 and 35 degrees east longitude and between two and three degrees south latitude. It makes up part of the Lake Zone in the western part of Tanzania. In the eastern part, it borders the Arusha region and on the boundary there is the Serengeti Park.

The major ethnic group is the Sukuma. Other ethnic groups are Nyamwezi, Sumbwa, without ignoring the Nyiramba, Taturu, and Hadzabe from neighbouring small groups who have also settled in Shinyanga. The population has grown dramatically from 899,468 people 1967 to 2,805,580 in 2002 by 200 percent. Shinyanga ranks second after Mwanza in the 2002 countrywide census. Shinyanga region is divided into five administrative districts, Kahama urban, Kahama rural, Kishapu, Shinyanga rural, and Shinyanga urban (URT, 2013). In order to understand the location of the Shinyanga region, see Figure 7.
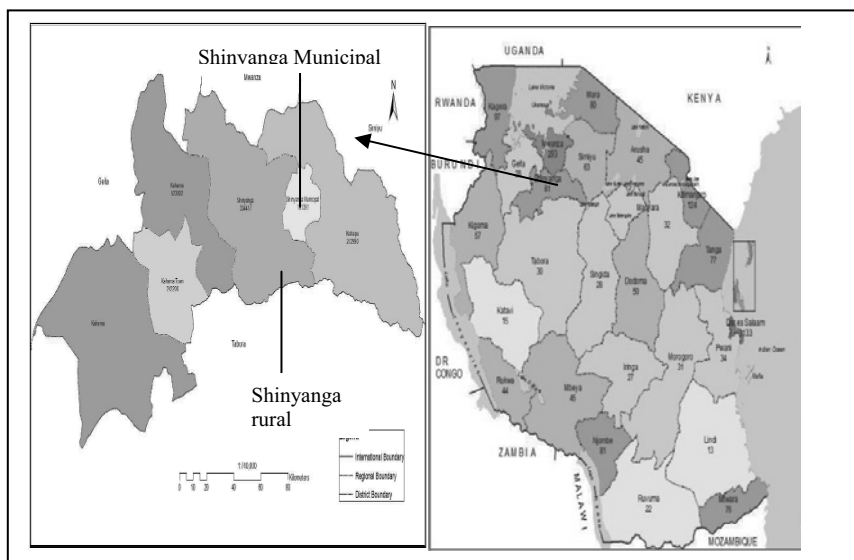
Figure 7. Map of Tanzania location of the study area in Shinyanga region

A brief socio-economic description of Tanzania: The socio-economic status of many families in Tanzania is low and families fail to support the education of their children, which as a result increases dropout rates (URT, 2011). Tanzania is among the least developed countries (LDC) in the world with a total population of about 44,928,923 people (URT, 2012). The overall poverty level in urban areas is substantially lower than in rural areas. Among the urban population, the 'poor' fraction is 13 percent compared to 87 percent in rural areas (URT, 2003). I have used the notion "poor" to mean suffering from lack of basic human needs such as education, nutrition, clean water, health care, and clothing because of an inability to afford. The House Budget Survey (HBS) 2007/2009 reveals that about 19 percent of Tanzanians live below the food poverty line and 21 percent live below the basic needs poverty line (URT, 2009).

Shinyanga status: In spite of having gold and diamond mines in the region, Shinyanga has remained among the poorest regions in Tanzania. With the massive investment in gold and diamond mining, it was possible to see the economy changing drastically; however, the mine sector is yet

to contribute significantly to the region and specifically to education. In 2004, the Shinyanga gross domestic product and income per capita ranked 17th among the 20 administrative regions of the country. Over 90 percent of the population lives in rural areas. The population is moderate, with an average population density of 55 persons per square kilometre in 2002 (Ngasongwa, 2007).

Primary education in Shinyanga: Why has Shinyanga been chosen for the study? Historically, schools in Shinyanga have performed unsatisfactorily when compared to other administrative regions of the country. Basic Statistics in Education (MOEC, 2001) show that, of the 20 least developed districts in Tanzania, 6 are in Shinyanga region. Shinyanga region is the lowest in performance in the Primary School Leaving Examination (PSLE). In 2002 it was the last in the PSLE among 21 regions of Tanzania mainland of that time, currently there are 25 regions.

Since 2001, Shinyanga region has experienced the highest teacher-learner ratio, which discourages teachers to work in the region (URT, 2001). I selected the study area purposefully because I had been working in Shinyanga for more than six years. It is a place where I have worked in the EQUIP program since its inception in 2003 to the period of this study.

However, conditions of poverty, inadequate public services, and a largely subsistence economy have undoubtedly made teaching difficult. The costs of educating children and the effort to support the family are together nearly impossible for many parents. Ngasongwa (2007) points out four factors that might have slowed down the development of education system in the region. These include the absence of active investors in education, the tradition of the Sukuma of delaying sending their children to school, parents' restrictions imposed on girl's education, and preferring a dowry to education. In Sukuma culture a girl child is not valued for education.

5.4 Selection of respondents

A purposive or non-probability technique was employed in order to identify desired potential respondents for the study. Through purposive techniques, each respondent is selected on the basis of meeting the determined criteria (Cohen, Manion & Morrison 2007), that is with adequate experience of the phenomenon studied. I purposively selected the respondents who I considered to be able to provide in-depth information with rich analysis (Patton, 2002). The sample was selected based on the aim of the study and the researcher's judgement, which means I looked for those who had attended the EQUIP in-service education programs assuming that they had adequate experiences relating to the phenomenon to be researched.

Teachers from the EQUIP program (2003-2008) who had worked for not less than three years were selected to participate in the study (see also Table 4, an analysis of the respondents' experience background). First, I determined the selection criteria to follow in choosing the respondents, guided by these questions: Is the teacher an experienced? How long has the teacher been teaching in the project schools? Is the teacher willing to participate voluntarily without pressure? Is the teacher willing to devote time to participate without termination? Is the teacher willing to describe her/his experience during the interview process? Is the teacher ready to be observed while teaching? Finally, the respondent had to be teaching in grades five or six.

My ambition in selecting respondents through purposive sampling was not for a comparison between subjects or schools. Another consideration is the possibility of getting the most experienced teachers out of the population, rather than considering a representative sample of the population. By the time I selected the sample, the respondents were attending their 5th year of the project implementation cycle. For that reason the sample was thought to have broad understanding of the phenomenon under study (cf. Merriam, 1998). However, the choice of the respondents has to reflect the research questions as presented in 5.1, namely: a) To explore teachers' experiences as constraints to their work and b) to explore teachers' actions for improvement after undergoing

professional development courses with EQUIP. Drawing from the tasks presented, forty primary school teachers from ten primary schools were chosen to be the source of the empirical findings of the study.

In order to obtain in-depth experience of the classroom work, three subjects taught in primary schools were selected to guide the interviews, class observation and videotaping. These subjects were Kiswahili, science, and mathematics for standards five and six. I assumed the teachers were competent in teaching these three subjects and had enough understanding of what was being studied.

The assumption behind choosing grade five and six first was that the learners could interact easily with their teachers during the lessons. Second, the two classes were not under examination pressure. In the Tanzanian education system, classes in grade 7 and grade 4 sit for the national examination (URT, 1995). The grade seven examinations is the Primary School Leaving Examination (PSLE), marking completion of the primary education cycle (see Figure 1). PSLE is a tool for the selection of learners into secondary education. In the same way, the grade four examinations are for assessment to allow transition to grade five (MoEVT, 2009). Through purposive sampling, I organized and carried out two phases of data collection (See Figure 8 and 9).

Phase one: Interview sampling: The sampling involved 40 respondents selected from ten primary schools from Shinyanga district councils. I selected the ten schools purposefully from 172 primary schools in the district. The sample derived from a population of teachers in the program area as shown in Figure 8.

| Total teacher population Shinyanga district | Sampling targets | Sampled population |

Total teacher
population
Shinyanga district

Sampling
targets

Sampled
population

Five rural
schools, 20
respondents

172 schools,
(about 2,033
teachers)

10 schools,
40
respondents

Five urban
schools, 20
respondents
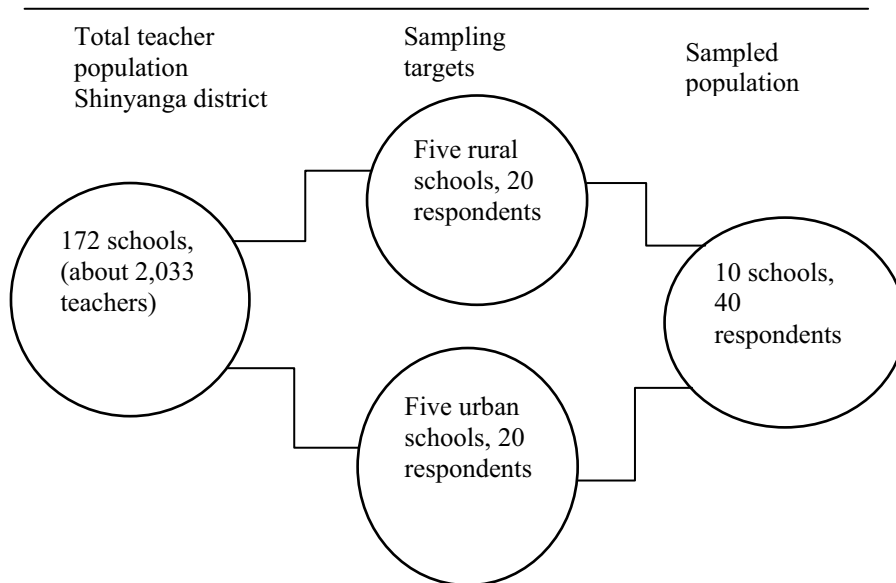
Figure 8. Phase one sampling of respondents

Phase two: Post interview sampling. Phase two was carried out six months later after interview one. However, in phase two, I selected 12 respondents from the 40. The selection was purposeful and based on phase one patterns. Together with the research assistant, I observed their lessons and four respondents among them, and the lessons were video-recorded. According to the categories identified in phase one, I probed further into the questions asked. No new categories were established in this interview, but rather information was added to the already established patterns. The researcher wanted the respondents to reflect on the meaning of the experiences gained from the phase one interview in order to intensify the interpretation. The second purpose for conducting interview phase two was for the respondents' validation. The teachers were asked to expand their explanations from what they had given earlier. In some cases, we added probing questions and even re-phrased for clarity and more understanding (Thomas & Pollio, 2002). To develop representatives

I divided the area of study into three geographic locations and then purposefully sampled the schools and the respondents, as shown in Figure 9.

Total research population in phase one	Post target sampling	Sampled population in phase two

Two schools from urban, five respondents

10 schools, 40 respondents

Two rural-urban schools, four respondents

Five schools out of 10 in phase one, 12 respondents

One rural proper school, three respondents
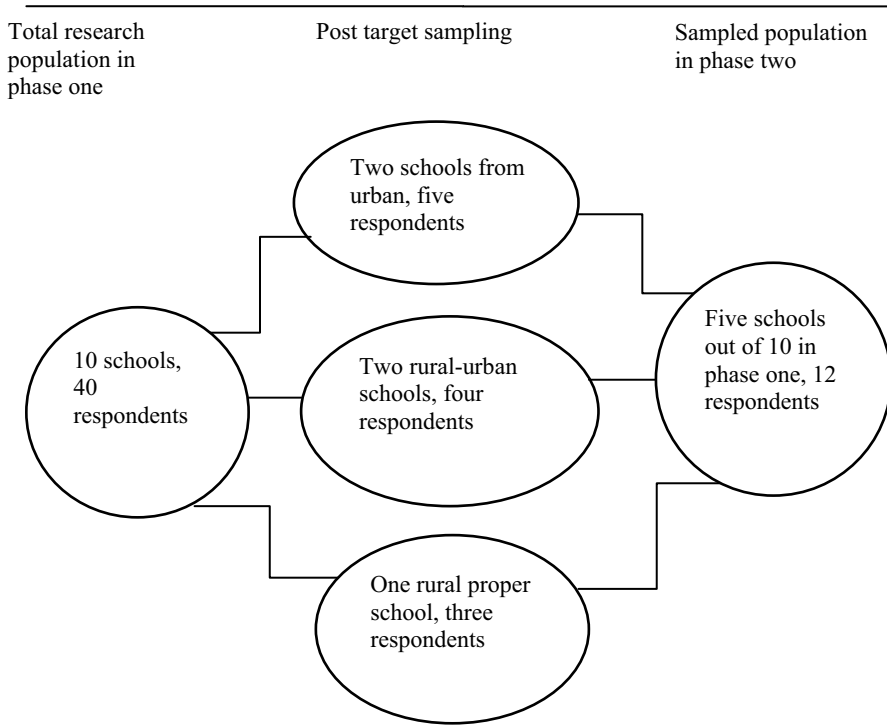
Figure 9. Phase two Sampling of schools and respondents

The whole process of sampling in terms of number of schools gender and their status is elaborated in Table 3.

Table 3. Summary of the participating respondents in relation to gender

Type of participants	Phase1 target				Participated			Phase 2 target				Participated		
EQUIP teachers	#	M	F	T	M	F	T	#	M	F	T	M	F	T
	10	7	33	40	7	33	40	5	2	10	12	2	10	12
Total	10	7	33	40	7	33	40	5	2	10	12	2	10	12

Key-#–Number of schools

Cohen, Manion and Morrison (2007) assert that researchers build up a sample that is satisfactory to their specific needs. In that sense, the selected sample had qualified to be included in the study. To ensure I got the right level of experience in the sample, five years of teaching experience and above in teaching was one of the criteria. The respondents ranged from having between 5 and 21 years of teaching experience, as summarised in Table 4.

Table 4. Summarized background characteristics of respondents

S/N	Years in teaching	# respondents	Qualifications	Lessons taught
1	5-10	8	Grade111A Certificate	Science, Mathematics and Kiswahili
2	10-15	17		
3	15-20	13		
4	21+	2		

I designed data collection procedures in such a way as to elaborate all the processes of preparations, data collection, data analysis and report writing. The purpose of the design was to ensure that the evidence gained enable me to answer the research questions as unambiguously as possible. Data collection design is a detailed plan, providing an overall framework describing the steps which I used to collect data, analyze, and do report writing. The design is compared to architecture, in the sense that it is a plan for assembling, organizing, and integrating information (Merriam,

2002). One can follow easily the structure and the procedures in Figure 10.

Preparations   **Phase one data collection**   **Phase two data collection**

Orientation of research assistant, instrument and preparing to research

Interviews and lesson observation

Preliminary coding

Interviews observation and videotaping

Data analysis

Report writing and discussion

07   08   09   10   11   12   13   14
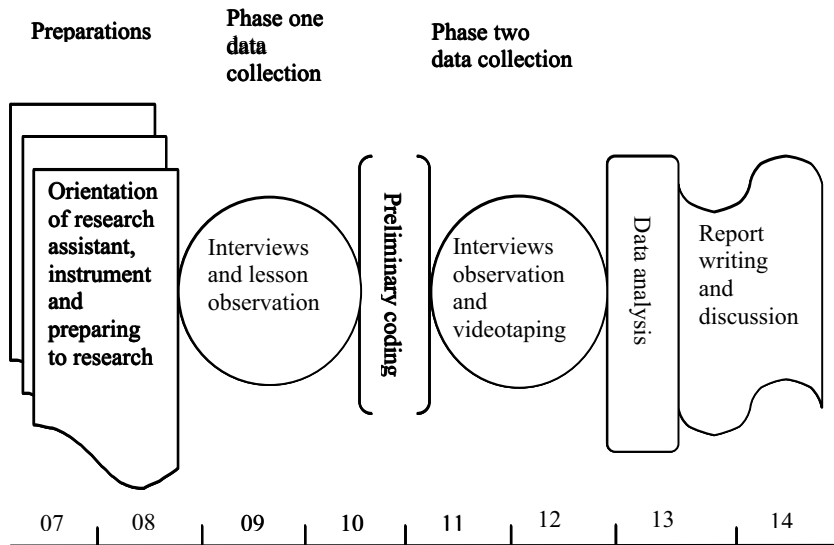
Figure 10. Data collection, analysis and report writing procedures

The process of data collection began with the process of identifying the research topic and area for the study, developing tools for data collection, and sampling as preparatory processes, then, orientation of research assistant on the research procedures, and instruments for gathering data. The orientation lasted two days, and was followed by checking the validity and reliability of the instruments.

Four teachers who were not in the sample from the Municipal school were involved in checking the reliability of the instruments that helped with rephrasing the interview questions and the observation checklist and putting together some related items. This process lead to a few modifications and omitting items found unnecessary to be included in the interview and observation checklists.

Data collection was through three qualitative instruments: interviews, classroom observation, and videotaping. The interview was the primary instrument of data collection (Rossman & Rallis, 2003); observation and videotaping were secondary instruments to enrich and check the interview data. I involved one research assistant throughout the process of data collection to establish reliability across researchers. All the three instruments employed are discussed in detail in the coming sections on how they were applied to suit the study.

The interviews: The aim of interviewing was to find out what the teachers' thoughts were concerning teaching constraints and actions for improvement after attended the EQUIP training. I designed an interview checklist (Appendix 1), which determined the kind of the interview which would be held (van Manen, 1990). Having an interview protocol helped to focus the interview on the topics at hand. With interviews, I was able to explore the lived experiences of teachers concerning the phenomena under study.

In addition, the interviews took the researcher into the respondents' world: in this case, the classroom. In a way, I tried to understand the teachers' classroom actions as they were described (see Bryman, 2004; Cohen, Manion & Morrison, 2007). Through the interviews, I gained access to information about teaching constraints and actions taken for improvement, which could not be gathered through observation or questionnaires. With using an interview it was easy to probe more into the teachers' responses and what has been happening in their daily life in the classroom (Patton, 1990), and this was also a kind of validation to the responses. On listening to the teachers' descriptions, I was able to understand their experiences of teaching (Silverman, 2000).

Together with my assistant I collected data through semi-structured interviews. I chose to use semi-structured interviews because they provide more space for discussion and learning about the problems, opinions, and views of the respondents than in structured interviews which have a formalized limited set of questions (Cohen & Crabtree, 2006). Moreover, I wanted to gain a high level of response to the open-ended questions produced from the research questions. The participants were interviewed

as experts on their own teaching and were not bound to the order of the questions since their responses sometimes directed a change of the ordering.

In order to be systematic with the data, a checklist was designed with general open questions (see Appendix 1). The checklist gave the interviewees a great deal of flexibility in replying. The interview started with general questions like 'Describe your teaching' or 'How have you taught the lesson?' During the entire interview, the questions asked to the respondents motivated them and sustained their interest in explaining more about their experiences (Larzén, 2009). The flexibility in questioning also helped to adapt the questions to the interview situation and to the respondents. When the participant did not understand the question, it was easy to re-phrase it, to make it simpler. When the information given was not sufficient, probing questions followed (Bryman, 2004).

Preliminary coding started immediately after gathering the data, (see Figure 10). The interview took about 40 to 60 minutes, depending on the information the interviewees were able to give. During the interview, I tried to remain as unbiased as possible in terms of verbal and non-verbal expression in order not to influence or to give any sign that could direct the interviewees to the answer. However, this was not always possible since the interviews were in the form of a conversation.

All the interviews took place at the school. The interviewees selected the date, time, and place suitable for both the researcher and the interviewees. The selection was based on security, where the researcher and the interviewee had to feel secure and with no interruption from outside noise or people, a place which allowed recording the conversation without being interrupted. The interviews were carried out in an ordinary or natural setting at their school premises. The classroom and the subjects which the teacher taught according to their normal time schedule contributed to the natural nature of the context. Kincheloe (1999) asserts that the context has to be as natural as possible because human experience tends to change with a change of the context.

The interviews were in Kiswahili as the national language and medium of instruction of teaching in primary schools. The use of Kiswahili allowed the interviewees to express themselves freely in the language they know (Rossman & Rallis, 2003). However, when I started the interviews the social and emotional atmosphere was rather formal to some interviewees. The respondents found it difficult to express their teaching experiences. Nevertheless, with time, they gained confidence and trust, which motivated them to describe their teaching experiences.

All the interviews were tape-recorded, with 173 summarized typed pages documented and transcribed. The respondents were informed of the necessity of using a tape recorder during the interviews. Recording interviews on a tape recorder allowed greater attention to be paid to the interviewees. It also provided a high level of detail, which one cannot remember and note-taking cannot replace (Rice & Ezzy, 2000). It was possible to give absolute attention to the respondents' descriptions of their experiences in the classroom. I described the data verbatim, without changing anything, and then later translated them into English. Again, during translation I tried to express the way the message was collected without changing its meaning.

Observation: During lesson observation, my research assistant and I observed 40 teachers (lessons) in phase one, and 12 in phase two. The lessons lasted for 40 minutes each. Observation took us inside the classroom settings (Rossman & Rallis, 2003). Being in the classroom, we were able to see phenomena at first hand. This helped to discover the teachers' attitudes and the social interactions that we could not obtain from the interviews. The information interpreted enriched the interview pattern. After observation, I discussed with the research assistant and agreed on what to take and include into the study. I used my own knowledge to interpret what was observed and added to the pattern developed from the interviews. This made up 25 summarized pages of written interpretation. First, I observed the lessons and then followed the interviews in order to have an overall impression of the setting and what might raise questions during the interviews. This gave me an initial impression of the learning environment and the teachers.

Observation implies examining behaviour or an event rather than asking questions about it. I used structured observation in data collection to examine the teachers' classroom behaviour with the purpose of describing experiences they have. Structured observation is a designed type of coding scheme to record behaviour. Through structured observation, I gathered information on phenomena in the way they occurred in the class.

My motivation in using structured observation was to enrich my primary data collection instrument, the interview. I chose the following four areas to focus on during observation which I thought could help to improve information gathered through interviews: planning to meet the learners' learning needs, mastery of the subject content, guidance of the learners' learning, and teaching strategies applied in lessons. Within these broad areas there were some aspects to guide the observation (see Appendix 2).

During observation, the research assistant and researcher sat at the back of the classroom, watching and recording the teachers' actions and using the checklist developed (see Figure 11). I applied Creswell's (2008) investigator triangulation, where each researcher recorded what she/he observed and immediately after the observation, we shared our notes. The aim of the protocol was to ensure that each respondent's actions were recorded thoroughly (Bryman, 2004).

In structured observation, people know that they are being observed and can change their behaviours dramatically. I was conscious of this from the beginning and introduced the purpose of the observation and the procedures to follow. However, to some persons it might not be that easy to accept the situation and behave normally. Through observation, we were able to study the interaction between the teacher and learners in the classrooms and observe the physical environment of the class. This gave a better understanding of the real meaning of the experiences of the teachers.

Despite the advantages of collecting first-hand information, some scholars have criticised observation. Bryman (2004), for instance, argues that observation can cause bias since it concentrates on direct behaviour and does not allow the observer to grasp the meaning of the behaviour. To minimise bias, we therefore discussed through interview immediately

after observation. The organisation of the classroom during lesson observation and videotaping was similar to all the classes despite the differences in the number of the learners. An example is illustrated in Figure 11.
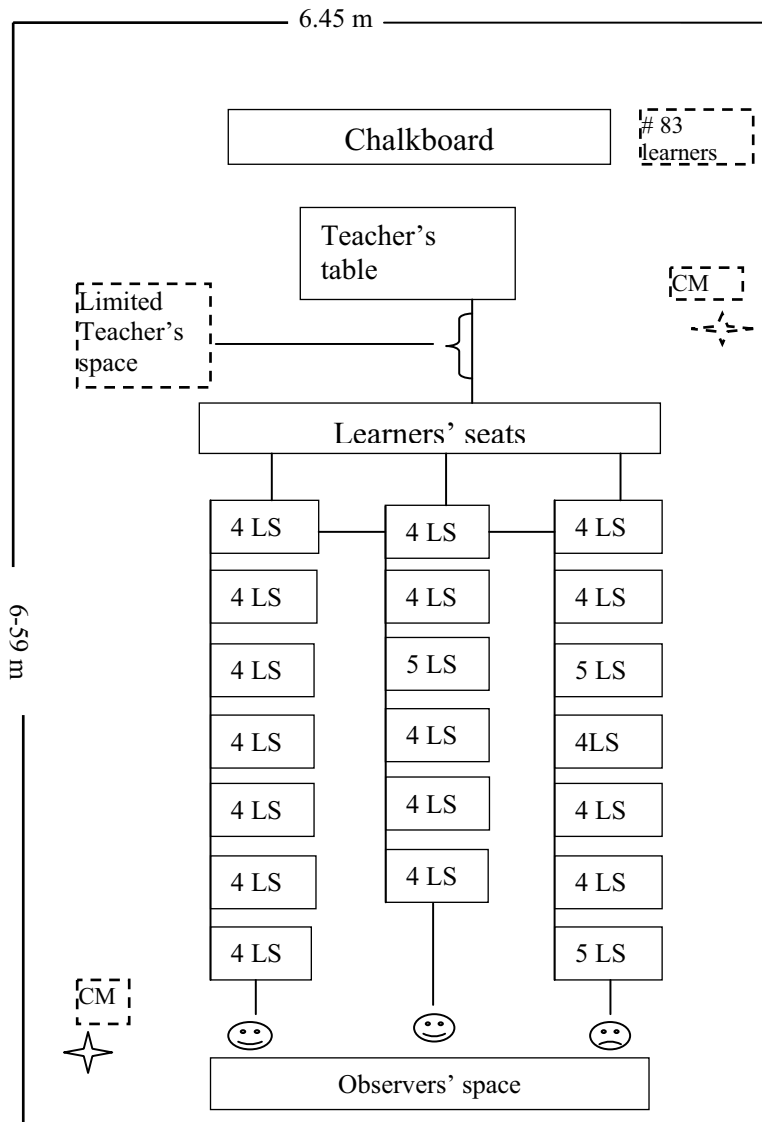
CM ✧ Different camera positions; LS- Seat with # of learners

Figure 11. Classroom seating arrangement during lesson observation

The seating arrangement for all classes was a traditional one, with long desks shared by four to five learners in some classes. The desks are small and designed for three learners, but due to the general lack of desks, four to five learners squeezed into one desk, which made writing difficult. Due

to the limited classroom space, the desks were difficult to move and organisation of groups seemed to be difficult.

Videotaping: Henning, Van Rensburg and Smith (2004) argue that data collection through words (interviews) alone does not carry the full message and may lead to naïve, unrealistic interpretations. It is important to look for other ways that indicate how interviewees communicate their thoughts. As such, I videotaped four teachers' lessons from the sample when they were teaching in the normal schedules to capture further what they expressed verbally. There were no new criteria set for their participation other than their voluntary willingness.

The videotaping was done during their normal lessons of 40 minutes as allocated in the general school timetable. The video camera was not in a fixed position due to the organisation of the classrooms and the inflexible desks and sometimes had to be moved to escape the interference of sunlight through the windows (Figure 11). Before the entire recording, the camera person made a test recording for each teacher in her/his classroom in order to be sure about the quality of the video recording.

One lesson was recorded per day. In order to obtain a wider coverage and to minimise the limitations of the videotaping, the camera person taped the lessons from beginning to end without choosing any parts of the lessons (Rosenstein, 2002). After the videotaping the researcher and teachers watched the video together and discussed some interesting moments or episodes as they appeared. Some were surprised to see their actions and behaviour demonstrated during the lesson. The research assistant and I tried not to make any judgemental comments about the pedagogical actions observed because that was not the intention, which was rather listening to the teachers' reflection responses through guiding questions. Although some asked about their teaching before watching the video, they realized the answers through watching the videotape.

The motive for using videotaping was to extend further understanding of the phenomenon under investigation. The videotaping was a kind of completeness, fine-tuning and a kind of deepening of the material at hand. It was also a means of triangulation of the interview responses.

Furthermore, it was a way for the respondents to view their own actions and behaviours in relation to their experiences described during the interview (Lyle, 2003).

However, despite the advantages video has in storing information, it has some limitations in terms of the quality of the recording, since it depends on the camera person (Rosenstein, 2002). Another limitation is that it cannot select or record anything that is out of its field and lens. To minimise these limitations I first pre-tested the camera before the entire taping, and furthermore the taping involved the whole class without selecting incidents to record.

Narrative research: Narrative is a popular way of carrying out qualitative research by analyzing stories or experiences (Holloway & Freshwater, 2007). It deals with an experience as it is lived, reconstructed, reinterpreted, and the experience can be described through story telling.

I used narrative as a method of data analysis and not for data collection. The extent to which the stories provide insights about the lived experiences of two primary school teachers has been observed. Narrative was also used in order to construct stories from the teachers' descriptions, to understanding further their experiences and learn more about the teachers' constraints and actions for improvement. The stories are a kind of life history of the teacher's experiences in the classrooms, collected through a series of semi-structured interviews. Through the analytic process I was able to detect the main narrative themes within the teachers' descriptions about their classroom lived experiences.

Like other interpretations, the narratives about teachers' work are from the interview transcriptions of the teachers interviewed. They reflected on their experiences and compared them with the position they are holding at present in the classroom. On the one hand, the narration is an effort to make sense of the teacher's constraints in teaching. On the other hand, it tells the story of improvements in teaching that the teacher has experienced after attending courses on pedagogical knowledge and pedagogical content knowledge (see also Riessman, 2005). People by nature live stories and tell stories of those who live, but not all may be

willing to tell stories of their lives. Tabu and Thomas (respondents) have described their lived experiences of classroom constraints and improvement in teaching actions through stories.

Narrating the teachers' experience was a way of thinking, not only as meaningful stories that helped me make sense of the classroom actions, but also as a lively and important feature of the classroom work. It was also a way of understanding the teachers' classroom work through the construction of stories. Thorne (2000) asserts that putting experience into words, verbally, in thoughts or writing changes the actual experience into a communicable representation. As such, teachers communicate their experiences and are understood by other people in a wider context in the form of stories.

Labelling the respondents: During the interview and lesson observation the respondents were given anonymity or pseudonyms. The names were given in order to provide privacy and confidentiality. The naming was followed throughout the data collection, analysis, report writing and publication.

5.6 Analysis of the data

The purpose of analyzing data is to make sense of it and also make it understandable to the reader (Merriam, 1998; Rossman & Rallis, 2003). The researcher is engaged in a process of trying to see the world differently and to attend more actively to the respondent's views. Data were treated genuinely, because the ultimate goal of a phenomenological data analysis is to seek meaning and to identify themes that will hold the experience. Giorgi (1971) claims that any research method used has to be responsive to the phenomenon. Responsive in the sense that it has to uncover the meaning experiences of the investigated phenomenon to the extent that it leaves no more questions to ask.

Bearing in mind the aim of the study and the kind of data collected, a combination of approaches were used for analyzing data. These included the descriptive approach (Giorgi, 1985) and inductive approach (Thomas, 2003). The inductive approach allows research findings to emerge from

the frequent, dominant categories inherent in raw data without restraints posed by raw data. In the study, an inductive approach was applied for the aim of condensing extensive and varied raw text data into a brief summarized text. I wanted to establish clear links between the research questions. In addition, the horizonalization approach (Moustakas, 1994) was used. Horizonalization is a process of listing significant themes in the participant's statements that are relevant to the topic and give them value. Therefore, the descriptive, inductive and horizonalization approaches involve several steps of description, reduction, and reflection.

The major categories derived from the respondents' descriptions were further described and interpreted. It was useful to follow various processes in the study to analyze the experiences of primary school teachers of constraints and actions for improvement of teaching as described in Figure 12 and elaborated in seven steps. The summary of the seven main steps for data analysis is illustrated in Figure 12. The double arrow means that for each step I had to reflect back to get the interconnection of the meaning.
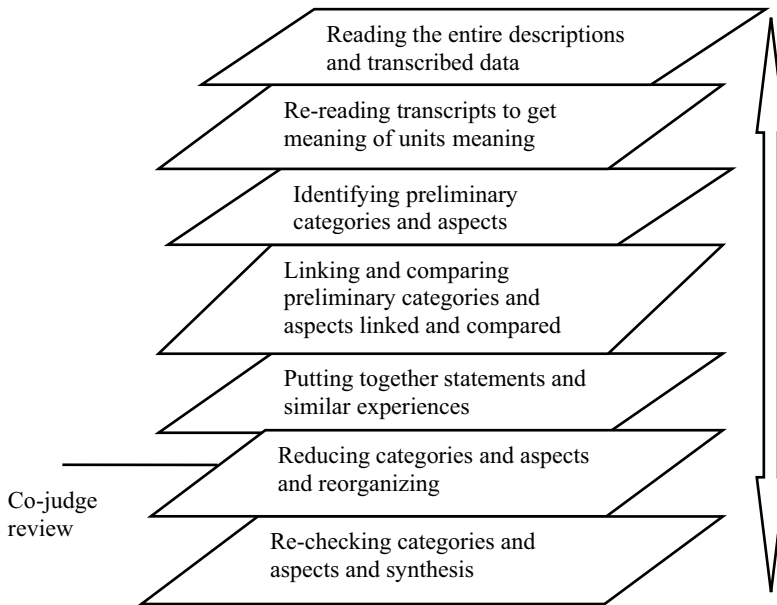
Figure 12. Summarised key data analysis processes

In the first step, the entire interview descriptions were read and interpreted notes compiled from the class observation. I kept listening to the interview tapes repeatedly, and read interpreted notes from the class observations. Any pertinent statement from the questions asked to the respondents was noted in order to obtain an impression of the whole statements and the inner meaning of the experience. To get a sense of the whole statement and of the study, the entire descriptions were read. This involved listening to the interview tapes two to three times, transcribing the tapes and reading the entire transcripts.

In the second step, the transcripts were read and re-read in order to obtain deep immersion in the text. Reading the meaning units several times made them clearer. Re-reading of the transcriptions helped the process of discriminating units of meaning, focusing on the teachers' lived experiences of the teaching constraints and the actions taken for teaching

improvement. It was also in this step that negative and positive statements were separated. I highlighted the text to indicate every new meaning identified (van Manen, 1990).

Re-reading transcripts and re-listening to audiotapes allowed the grouping of the transcripts with interlinking meaning and relevance to the study: that is, establishing similarities with and differences to the teachers' descriptions. This finally led to the construction of preliminary categories. Re-reading of the transcripts was an ongoing process, which went through all the stages of the study (Rossman & Rallis, 2003). By the end of this step, there were already a number of descriptions of teachers' constraints and the improvement of teaching actions identified.

Having the units of meaning at hand, the third step was grouping the statements into clusters of similar units of meaning. Each transcript was examined for possible theories and aspects in order to understand the nature of the respondents' experiences. Thereafter, clustering of units of meaning was performed in order to create possible theme or categories. Overlapping statements were dropped. I thoroughly examined the list of units of meaning, trying to elicit the essence of the units of meaning within the holistic context of the study.

It was also important to go back to the recorded interviews to listen to them once again in order to verify the discriminated units of meaning. Through deep analysis of the descriptions, I identified three dimensions of teachers' lived experiences: interaction, context and role. Within these dimensions, six categories were identified. The transformation took place through a process of reflection (Giorgi, 1985) (see Figure 12). Then, significant statements or quotations from the participants' descriptions were identified to illustrate the categories and aspects and linked across the statements.

The fourth step was a reduction stage. Based on the revealed categories, further clarification and elaboration of the meaning was achieved by relating aspects to each other and to the categories, and relating category to category. This step involved reducing the number of categories and aspects by collapsing or eliminating through the process of

phenomenological reduction (Thomas, 2003). Related aspects and the categories were linked, and in some cases separated wherever I found there was some unrelated information. I continued reflecting on the categories in terms of the way they fitted together and collapsed them into each other. This led to fewer and more compact or rich categories and aspects.

In step five, reflection on the constituents of the aspects in the concrete language of the respondents continued. I produced all the participants' descriptions of the constraints encountered in teaching and the actions for teaching improvement separately. In order to produce richer descriptions of the teachers' statements into important categories and aspects, the separation was further condensed. The respondents' descriptions generated further insights into the essential aspects of the teachers' experience, which lead to putting together statements and similar experiences. Interesting excerpts of teachers' experiences from the transcripts were extracted to reveal the expressions of teachers' constraints and actions for improving teaching. This process helped to relate meaning to the respondents and to organizing rich descriptions of the aspects.

In step six, reflection on the categories and the aspects by reading through each category and the descriptions attached to each continued. This process helped to further identify common categories, and to reduce and re-order them into a structural description. This process enabled the organisation of six qualitative categories and twenty aspects. The six essential qualitative categories derived from the two research questions.

On the one hand, of the constraints, three categories were identified, and on the other hand, in terms of actions taken for improvement, also three categories were revealed (see Figure 13 and 14). During this stage a co-judge reviewed the categories and the aspects identified. This is discussed further in subsequent sections in terms of triangulation to achieve validity of the study. Critical ideas that arose helped to shape the categories and aspects. This was a final stage of merging, collapsing and dropping some categories and aspects which were largely not related to the research aim.

Finally, all the revealed categories and the aspects were synthesized into two structural models based on the research questions. Giorgi (1985) refers to these as the structure of the experience. Figures 13 and 14 in the results chapter elaborate the model.

5.7 Validity, reliability and ethics

This section portrays how validity, reliability and ethics have been treated. Validity and reliability are fundamental in appraising any scientific study tradition, whether quantitative or qualitative (Patton, 2001). While validity addresses the question of how well an instrument measures what it was meant to measure, reliability deals with consistency and repeatability over time of the results obtained from the instrument and respondents (Aspfors, 2012). It is concerned with the accuracy of the measurements. In this study, validity and reliability are criteria that question whether the primary school teachers' constraints to teaching identified as a hindrance to teaching, on the one hand, and the actions taken to improve the teaching, identified as the outcome of professional development, on the other, are credible and trustworthy.

However, the notions validity and reliability seem to fit in the quantitative research approach (Larzén, 2005, Silverman, 2006), and the researcher has to state clearly the role of each right from the start. Researchers in quantitative studies always try to delimit phenomena into measurable units or categories that can be applicable to all subjects (generalisation).

Certain qualitative researchers, debate on using the notions reliability and validity in qualitative research (Golafshani, 2003). As a result, pioneers and advocates of qualitative research opt to use credibility and trustworthiness as appropriate terms to replace validity, and dependability and transferability replace reliability.

Regardless of which notion is used, the value of these notions is important, as the principles of assessing the quality of knowledge generated through research remains equally the same and unharmed.

In this viewpoint, Chambulila (2013) suggests that in the whole process of conducting research, researchers have to act with honesty and integrity to substantiate credibility and dependability. To validate the credibility and dependability of the results of this study, notions from both quantitative and qualitative research designs are applied. As Aspfors (2012) asserts, certain researchers operate in between the two research traditions. This justifies the possibility of using the notions from both quantitative and qualitative research.

Based on this argument for this study I decided to use notions from both research designs. The reason is that validity and reliability are notions commonly addressed in much educational research, both qualitative and quantitative in developing countries such as Tanzania. The other notions as suggested by Lincoln and Guba (1985) of credibility, trustworthiness dependability and transferability are still new but can easily be clarified and accommodated.

Validity: Validity in research addresses the extent to which the empirical findings of the study are true. It is tested by exploring the findings as per general aim (see Chapter 1 and research questions in Chapter 5). Validity in this study, on the one hand, questions whether the results stand in terms of primary school teacher's experiences on constraints to teaching and of the teaching actions for improvement after undergoing professional development courses offered by EQUIP. If the experiences expressed by the teachers in the two research questions (see 5.1) correspond to the real experiences of constraints and improvement actions in real classroom situations, then the correlation between the result and the phenomena studied validate that the results are credible and trustworthy.

Credibility and trustworthiness, as seen earlier, represent validity in qualitative studies. The underlying question could be 'what measures have been taken to ensure the credibility and trustworthiness (validity) of the study? In order to answer this question, various actions need to be consulted. The use of triangulation was one of the measures taken in the collection of data (Groenewald, 2004).

Triangulation in the study is evident in the employment of two phases of data collection, as previously discussed (see figure 9). The aim of conducting the second phase of the empirical data was not only to deepen the data (see also Bryman, 2004) which were identified in phase one, but also to compare and contrast the empirical findings if they produce similar results. This was also a kind of member checking; the respondents were asked whether the interpretation made from the first phase interview represented their experiences on the constraints to teaching and the teaching actions taken for improvement. This process of using multiple means of collecting and verifying data plays an important role in enriching the quality of the data gathered. Triangulation means using multiple research methods or instruments to collect data in the same study topic as one means of validating the research findings.

Triangulation is used to enhance the validity of qualitative research. In this study, different instruments were used for data gathering, including interviews, class observation and videotaping to increase the validity of the findings as use of only one particular instrument may affect the consistency of the results (Denscombe, 2003). The observation and videotaping employed enriched the interview findings. During the interviews I and the research assistant used both tape recording and note-taking to capture data from the respondents. This was another means of validating the findings as it provided an opportunity for cross-checking the accuracy of the recorded interviews (Groenewald, 2004). Moreover, the purposive sampling also contributed to the validity since the respondents selected were knowledgeable enough about the phenomena studied.

As discussed earlier, to minimise pre-conception the researcher and research assistant asked questions directed to the participant's experience and feelings according to the requirement of the questions based on the checklist prepared (Appendix 1). This kind of questioning is what Groenewald (2004) refers to as bracketing.

Bracketing is another strategy of ensuring the validity of a qualitative study, and in particular in phenomenological studies. Using probe or follow-up questions during interviews is a means of bracketing. However,

here I wanted to clear out doubts, vagueness, and contradictions and deepen the data to ensure that validity was maintained in the study. To maintain the data as naturally as possible, I looked at phenomena as if they were happening for the first time from the description.

Bracketing, thus, is an approach to promote valid interpretation. I was conscious of not imposing my values in any way to influence the respondents' responses. This means positioning oneself in the individual's life world and using the self as an experiencing interpreter. As a way of validation, I tried to stick to what was given and described by the respondents and reported according to respondents' experiences (Giorgi, 1977).

However, this was a difficult situation to achieve. To ensure I and the research assistant did not influence the respondents, we used probing questions where needed to obtain clarity on misunderstandings or to deepen the understanding of the given information. This was an ongoing process before and during the interview, and throughout the data collection, analysis and reporting.

During the research process we tried to be conscious and set aside our pre-understanding and prejudices in order to allow new knowledge and understanding of the teachers' lived experiences of the teaching actions to be expressed. The process of re-reading and re-listening to the transcripts helped to understand the meaning of the experiences from the respondents' point of view. Reflection was considered during interpretation (see Figure 12) of the data analysis process.

It is claimed that qualitative studies have a high risk of being trapped in subjectivity when compared to quantitative research (Chambulila, 2013). This situation can distort the validity of the research study. To minimise risk, for each category and under each aspect I have supported my interpretations with detailed excerpts from the original description statements of the respondents. This is supported by Dahlberg, Drew and Nyström (2001) when they advise that it is important to illustrate the analysis with excerpts from the data. In understanding this, I have

presented the empirical data from the respondents without significant alteration, as it appears in Chapter 6 of the results.

Reliability: Realisation of measurements to guarantee reliability was also observed. A co-judge was involved as part of checking the inter-subjective reliability (see Figure 12 step 6) and also for reviewing the Organisation and the logic of the patterns against the aspects. The co-judge was given the statements of the categories and the aspect to work on and make critical reflection to see if my analysis and development of categories were free from personal bias. The co-judges re-read the statements independently and raised some observations which accommodated in shaping the study.

From the co-judge review, for instance, two aspects or sub-categories were qualified as main categories, which in my initial organisation or pattern were named as aspects (sub-category). One was '*use of the environment'*, which I named as an aspect of the broad category '*contextual constraints'*. The second category, termed '*encouragement' wa*s a motive of understanding the individual's capability and her/his belief that they can do better than before. The encouragement aspect derived from the main category of interaction constraints. The co-judge named it as '*motivation'*, for the reason that encouragement is a kind of motivation that influences the individual's inspiration. This is what pushed me to come up with encouragement aspect as a way of making individual teachers realise their potential. Based on the minor changes suggested by the co-judge, we discussed and agreed to retain the initial categories. In that way, there was no major restructuring of the main categories and aspects. Through discussion we agreed that I maintain the initial organisation, but I had to improve the descriptions of the aspects to accommodate the ideas discussed.

Reliability was also measured through examining the observation checklist. The research assistant and I compared data collected from the observation checklist and agreed on the key changes observed, which later I interpreted. Creswell (2008) called this inter-rater reliability procedure applied during class observation. This method is applied when

two or more individuals make observation on an individual's actions or behaviour at the same time as a group.

Ethical aspects: Research ethics are defined as a system of moral principles which controls the conduct of the study. Ethical considerations were observed throughout the study. It is important to protect the participants' privacy and confidentiality; this implies their rights of interests and safety in data collection, analysis and reporting of the results (Larzén, 2005; Silverman, 2007). Their purpose is to serve both scientific and human interests. Cohen et al. (2003) argue that researchers have to abide by ethical issues if they are to bring a rich ethical quality to their studies. According to Trumble and Stevenson (2005) researchers have to consider ethical responsibilities associated with his or her study. As such, they have to observe standards to avoid any harm which might be caused by carrying out or publishing the results of the research project. Research ethics cover a number of issues that need practical attention.

Observing and adhering to ethical principles was also another way of measuring the reliability of this study. These include ensuring the welfare of the informants, securing informed consent, maintaining honesty and handling data from the respondents with high confidentiality (Cohen, Manion & Morrison, 2000). To ensure that I abided by ethical aspects, various issues were considered, including securing informed consent, confidentiality and anonymity of the participants (Bryman, 2004; Cohen et al., 2007). Aspfors (2012) insists that consideration of research ethics is one of the scientific practices which must be given due attention because of the need for trust between science and society. To ensure ethical issues are taken care of, in this study certain measures have been taken into consideration.

Informed consent: Gaining informed consent entails informing the participants about the overall purpose of the investigation, as well as any benefits and risks from participation in the study (Cohen et al., 2008; Creswell, 2008). To ensure that guidelines were followed, I wrote a letter to the District Education Officers (DEO) to seek for permission to do research in their district schools. The letter included some important information such as the purpose of the study, the amount of time for

collecting data (number of days) and the time I needed from the respondents. In addition, I informed them how I would collect and use the data, the results, and the specific activities I would conduct. The DEOs informed the head teachers of the selected schools in writing. The head teachers were responsible for informing their teachers and all the steps we followed. I followed this line of information flow in order to maintain respect and make the whole process easier, motivating, and supportive.

However, the final confirmation of the respondents was one week before the entire data collection. I personally approached all the respondents to gain oral consent from them and later they signed the informed consent form. Verification of their responses and setting convenient dates and time for the interviews and class observation was done for all the 40 teachers selected for phase one and for the 12 selected for phase two. Furthermore, we discussed their voluntary participation and their right to participate or withdraw at any time and this was well elaborated to the district education officers and the head teachers.

Christians (2000) considers proper respect for human freedom as consisting of voluntary agreement to participate. All the selected schools and teachers agreed to participate in this study on a purely voluntarily basis. Moreover, I am convinced that all the teachers were motivated by the topic because it was touching on their daily work and not because of outside pressure like the school administration or otherwise.

The topic for the study and the overall purpose was introduced as well as how the data was going to be collected and used. I did not give full details of the aims and research questions since this might have endangered the validity of the study. Finally, we discussed the expectations and some ethical issues that might distort the interview, and any possible risks and benefits from participation in the research activities.

Confidentiality: Confidentiality and anonymity are distinct terms. Confidentiality as something spoken or written in confidence, charged with secrets. Anonymity is of unknown name, of unknown authorship. Confidentiality is akin to the principle of privacy (Oliver, 2003). It protects participants' privacy concerning the use of their names, identities

and specific roles. In my study, these were highly observed. I used names, places and other individual identities anonymously and they are concealed in the published results (Creswell, 2008). However, it can be difficult to ensure that anonymity is protected using the respondents' anonymity alone.

Throughout the study, I have been very cautious in not using or indicating the names of individuals during sharing of the information gathered and the knowledge of this study with other people. Data collection for the study is treated as highly confidential and kept securely. The data were stored in a computer with a protected password, and paper records kept in a locked file cabinet. On completion of the study, the audiotapes of the recorded interviews will be erased. Therefore, I took special care to avoiding including any personal information about the participants or use of any quotations that may have made them identifiable.

6 Presentation of results

In this chapter, the results of the empirical study are presented. The chapter is divided in three main parts. The first two answer the research questions. In research question one, teachers' experiences of constraints before being engaged in the EQUIP program are described. Research question two is dealing with improving teaching during the implementation of EQUIP from 2003 to 2008 and after the end of the program from 2008 and three years ahead.

I identified one major theme for each research question in order to portray the essence of teachers constraints in teaching (Figure 13) before the EQUIP program and the actions taken for improvement (Figure 14) as a result of professional development. In the third part, the central focus moves from the research questions to further deepening of the meaning of the teacher experiences. Some interesting results from phase two have been taken as examples of how teachers have been trying to solve some of the constraints discussed in phase one. Research question two emphasises the classroom actions taken for improvement.

As discussed in Chapter five, the respondents' descriptions of the phase two interviews, classroom observation and the videotaped discussion were meant to enrich the data gathered in phase one. Thus, I have fore grounded some types of phenomena experienced by the majority of the teachers.

Further, I have developed the character types of individual teachers revealed from the teacher descriptions. The last part of the results presents two narratives of teachers as taken from the interview descriptions. The first one is about the negative experiences of teaching in large classes with a shortage of teaching materials, and the second describes positive experiences showing and suggesting the importance of professional development for teachers. The narratives try to convey the teaching realities, and also further deepen understanding of the constraints and actions taken for improvement.

6.1 Teachers' experiences of teaching constraints

The teachers' experiences are subjective in relation to what they described. When they started teaching perhaps they were very enthusiastic with the profession, imagining how they were making learners learn. When they experienced real classes without support their enthusiasm turned to focus on the constraints.

First I report the results regarding experiences of teaching constraints (research question 1). In the teaching constraints, I identified three broad categories: *interaction constraints*, *contextual constraints* and *teachers' role constraints*. I have structured the presentation of the results according to these three categories. In each category, a number of aspects were revealed, comprising the meaning of the interpretations. An overview of the categories and the aspects is presented in Figure 13.
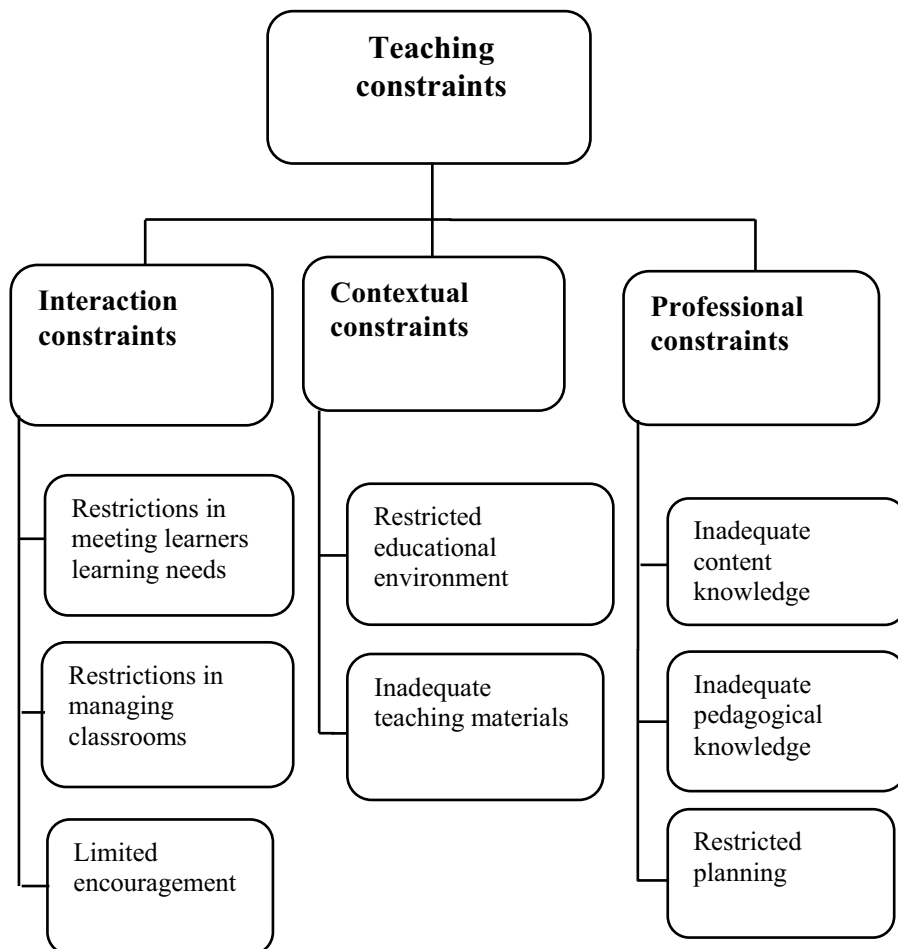
Figure 13. Overview of the categories and the aspects for teaching constraints

6.1.1 Interaction constraints

The classroom interaction constraints include *restrictions in meeting learners' learning needs*, *restrictions in managing classrooms* and *limited encouragement*. Restrictions in meeting learner's learning needs caused by class size were experienced the most critically by the respondents. In the discussion around interaction constraints, the focus was on what

constraints teachers face in interacting with learners in the classroom. The teachers were asked to explain their experiences of teaching constraints and of the effects on classroom interaction. They described factors which hinder interaction. However, the interaction constraint experiences predominantly involve features recognized as hindrances in teaching.

Restrictions in meeting learner's learning needs: In describing restrictions in meeting the learners' learning needs caused by class size, teachers had varied experiences. Class size seems to be the most problematic restriction to interaction and learning in general. Restriction in this context implies critical problems that a teacher faces or something that limits the smooth performance of her or his work. These could be limitations to interaction between the teachers and the learners and among the learners.

Teachers' experiences reveal learning needs concerning knowledge of the subject, skills, competences and ability to meet learners' expectations. Teachers also need to have time to reflect on and practice what they have learned in schools and in their environments. It has become clear that the role of Makunda in her mathematics class of 81 learners is important, but the task to ensure that each learner makes sense of learning is not easy. Makunda feels that by paying attention to the high achievers only, she can manage to teach her lesson within the set plan and time. This challenge emerged in her first interview:

> It is not easy to reach all the learners within a 40 minute lesson. The class is congested, with no space to pass and reach those who sometimes need support. Most of the low achieving learners are left behind with no support that I provide or get from their peers throughout the lesson. That is why they continue performing at a low level. When I teach I tend to involve most those who raise hands so that I finish the topic which I have planned to teach for that particular period and even to accomplish the syllabus. Really, teaching in a large class is challenging; even to achieve what I have planned is doubtful (Makunda, 14 years' experience).

Makunda's experiences depict how difficult is to teach in a large class of 81 learners and even to assist individual learners. Makunda seems not to

understand what to do in order to be able to support the low achievers in her class and at the same time accomplish her lesson plan for the day. As we have seen, Makunda teaches by focusing on the high achieving learners and leaving the slow underachievers behind.

Thomas's experiences in his science class of 81 learners indicate that he teaches through whole class answering. He never involves individual learners in the learning process. Throughout the lesson, he applies chorus answering, maybe due to his class being overcrowded. Another assumption could be due to inadequate pedagogical knowledge. He believes that the only way to make each learner learn is through choral answering. This means imitating how the teacher or another learner has responded, and then having the whole class loudly repeat the answer, two to three times. This way of answering can leave the low achieving learners without any help, because it is difficult to identify those who have not understood the lesson and provide close individual support. The interview highlights the problem:

> Well, I usually rely on whole class answering in responding to my questions. In responding to my questions, the whole class responds together loudly, sometimes the learners answer in rows. In fact, in such a situation, I believe the majority will get a chance to repeat the answers. Even though it happens, some learners just follow others' voices without understanding the content because when I happen to ask the same question to selected individuals, they fail to answer the questions they have answered in chorus (Thomas, 9 years' experience).

It seems that learning in large classes does not direct and support individual learners. However, the teacher is aware of the implication of choral answering in learning, since it prevents some learners from following and gaining insight into the content taught. From the teacher's point of view, choral answering had a negative impact on the learning process because it restricts low performing learners from engaging in the learning process.

In the same vein, Tabu depicts, in her Kiswahili lesson of 83 learners, the didactical relation between teaching methods. She describes the difficulties she is facing in choosing and connecting with the learner and

the content. She claims that it has not been easy to plan teaching methods that could suit all learners in her class. She feels that the organisation of groups is ineffective in large classes. Even if she organizes groups, the groups can be too large to allow interaction among the learners. In this situation, Tabu finds herself in a dilemma and she described why:

> In such a large class of 83 learners, even the methods of teaching which I use are those which do not involve an individual learner engaging in the learning process like organizing groups. When I organize groups, the groups are too big to support and accommodate each learner interacting during the lesson. In most cases, I just lecture and sometimes ask questions. Throughout the lesson, I simply work with those who are quick to grasp the lesson. Even the questions I ask are usually directed to the quicker ones because they can answer and allow me continue with my work plan (Tabu, 20 years' experience).

Tabu's description illustrates a restriction to quality of teaching brought about by a large class, as well as by the kind of teaching method she uses in teaching. She has shown the difficulty of selecting a method to support learning in a large class. As a result, only the high achievers benefit and enjoy learning in her class, which results in a situation of inequality. The teaching methods she uses focus on whole class learning, such as lecturing. She does not manage to assist the low achievers. Restrictions in meeting learners' learning needs risk leading to low learning outcomes that may also result in poor performance and classroom management.

Based on Makunda's, Thomas's and Tabu's experiences, it seems that a large class is problematic for all the teachers and their learners. Their experiences suggest that they do not have the knowledge and skills needed for teaching in large classes, which implies the need for a program of professional development for teachers.

Restrictions in managing large classes: Classroom management in this study entails all actions taken by the teacher to ensure organisation and time is effectively used during the lessons. Makunda experienced the problem of managing a large class in her mathematics lesson. The most frequently expressed restriction was a problem of paying attention to individual learners and managing learning. Makunda's and Dorotea's

statements describe experiences related to paying attention, listening to individual learners and managing their learning. She described her frustrations:

> In my class, learners are not attentive enough to the lessons because of overcrowding. Even management of the class is difficult. The class is noisy because of limited space to pass and organize learning activities for individual learners. It is even worse for organizing and monitoring their work. Even if I give them tasks to perform, it is difficult to pay attention to individual learners' needs and problems after marking. Much of the class time is wasted in shouting over the learners, calling for attention. Sometimes, I become frustrated when teaching in such a class because, I do not know where and how to begin the lesson (Makunda, 14 years' experience).

Dorotea expressed difficulties in managing learning in large classes and facing up to the learners' education and life worries, particularly with girls. Girls seem to be de-motivated and lose interest, and some drop out before completing their education.

> Large classes are not manageable; they cause disciplinary problems due to less time being available to attend to individual learners' concerns and resulting in poor performance. Learners in upper classes, particularly girls, need more attention to be paid to their worries about schooling and sometimes about life in order to motivate and interest them in remaining in school. This is missing and to tell the truth it is difficult to achieve. Sometimes I tend to apply choral answering due to the nature of the class. Again, it is difficult to manage the learners' learning since some can take it like a game and do not put serious effort into learning and are rather just interested in shouting (Dorotea, 10 years' experience).

The conditions are apparently frustrating for both Makunda and Dorotea. They perceive these experiences as puzzling in view of the fact that they make learners lose interest and worsen classroom relationships. Makunda views class size as problematic to learning and it affects learners' attentiveness. She found herself failing in trying to listen to individual learner's concerns. Dorotea ends in using choral repetition, which has the tendency to leave slow learners behind.

Limited encouragement: Susan's description shows that the nature of her mathematics class of 88 learners determines the kind of praise she gives. Susan's experiences of learners' motivation indicate that praising learners for efforts made in learning contributes to raising their performance. When it is missing learners are demoralized and disengaged from learning.

Praise can be verbal by using words like good and well done, and it can comprise showing respect for and trust in the learners. Susan's experience indicates that lack of praise for learners' efforts disengages them from learning. Susan recognizes the value and importance of encouragement through praising learners. A large class restricts encouragement of individual learners.

> I understand that learners need to be praised in their learning even simply by using words such as 'good, well done', in order to encourage them do well. In my class, it does not happen often because I do not have time to involve individual learners in participate in the learning process. What I have noted is that when I fail to praise them for the effort they have made, the classroom becomes dull and the learners are not active. The low achieving learners feel that they are undermined; therefore, they lose interest in learning. Despite being aware that praise is a catalyst that motivates and encourages learners to learn more and get involved in the classroom, and also builds better teacher-learner relationships, nevertheless due to the nature of the class (88 learners), sometimes it is difficult to praise individual learners (Susan, 16 years' experience).

Susan emphasises the importance of encouraging and engaging learners. A large class affects her teaching and she feels that lack of praise can change the classroom atmosphere and the mood of the learners and may stop them contributing to the lessons. The situation has also been experienced by Edda in her class of 83.

> Lack of praise for learners who attempt to answer questions and contribute to the lesson demoralises them and stops them continuing to participate in answering the questions asked. In some cases I could see the atmosphere of those attempting to answer my questions in the class changing abruptly just because I forgot to say a word of praise like 'good' 'well done' or clapping. I understand that praise encourages learners and

sometimes creates a competitive ethos in learning (Edda, 7 years' experience).

Praise for individual learners is more powerful in terms of behavioural change than giving praise to a group. Learners feel that collective or group recognition does not motivate them in their learning, but it tends to block efforts made by some learners. Boka experienced this in his class of 65 learners.

> Lack of individual praise during the lesson make those who answer questions feel unhappy, particularly girls and in lower classes. The learners feel they are not valued, although collective praise can be given to the whole class. In most cases, I just praise them at the end of the session because I am afraid that if I do it to each individual in a large class much of the class time can be wasted. From this situation, I have learned that immediate individual praise contributes to the promotion of learners' motivation in learning (Boka, 15 years' experience).

6.1.2 Contextual constraints

In the previous category, the teachers disclosed various factors that limit meeting individual learners' learning needs. In this category teachers described the constraints brought about by a lack of teaching materials and restricted environment. The most prominent experience teachers expressed under this category is lack of teaching materials to support individual learning and the major focus is on textbooks. The literature review suggests that if textbooks are available, they have a significant role to play in making teaching meaningful in primary schools, but unfortunately this is not the case. The teachers' experiences of contextual constraints are explained under two aspects, as shown in Figure 13.

Restricted educational environment: Teachers see the environment as an important resource in teaching and learning. The environment contains the surrounding physical, economic, social and cultural conditions. According to the findings, the environment is related to the availability of resources. Rega, a science teacher with 65 learners in her class, mentioned lack of funds to be one of the factors that restrict the availability and use of the environment. She argues that in order to prepare and improvise

teaching materials, adequate funds are needed. Lack of funds limits the provision of important and essential teaching materials for her classes. She explained the challenge she faces in teaching science in particular.

> Provision of some materials depends on the availability of funds from the district council. For instance, some necessary and essential teaching and learning materials such as charts, models and other instruments needed in the science kit, are not available. The learners do not engage in practicing the knowledge learned. Teaching science lessons needs enough materials for experiments and practice. However, I try to prepare some materials with learners to support the lesson, but some materials, such as test tubes, cannot be prepared from locally available materials (Rega, 10 years' experience).

Rega shows how limited government funding for education limits support for schools in terms of teaching materials. This contributes to learners' failure to carry out experiments to acquire scientific skills. Rega's experience shows that efforts are made to try to solve the problem of inadequate teaching materials. Her experiences reveal a concern about using the environment for preparation and improvisation of teaching and learning materials. Despite a lack of funds, teachers have been trying to bridge the gap by preparing teaching materials using local materials available in their environment.

Furthermore, within this aspect, time was stated to be another restriction in using the environment due to the heavy teaching and marking load which limits the production of teaching materials. Limba is in a dilemma about deciding which activities to perform fully within the limited time.

> I did not use adequate teaching and learning materials as needed because there is not enough time to prepare after the classes due to the heavy load of marking learners' tasks. Marking takes almost all of my leisure time. Is very difficult to balance, I have to decide whether to leave marking and prepare some teaching materials or only do marking, because all these activities have to be done after the school hours. Learners were not able to collect teaching and learning materials from their environment to meet the large number of learners in the class. The materials they brought were not enough for the whole class. In that case, it is difficult to use teaching materials in a large class as planned. When such a situation happens, then

I just teach the lesson with the few stretched materials (Limba, 13 years' experience).

Inadequate instructional materials: The results revealed that inadequacy of teaching materials limit the development of learners' basic literacy skills and thinking skills in general. I have used the notion 'instructional materials' interchangeably with teaching and learning materials. The teachers' experiences focused on lack of textbooks as a basic source of teaching materials. Learners do not get the chance to interact with each other and the available materials. Since learners therefore depend much on the transmitted knowledge from teachers, it causes a dependency habit in their thinking.

Hawa (81 learners in a class) emphasises a lack of science teaching materials, which forces her to teach science lessons theoretically. It seems Hawa does not use her learners' skills and knowledge to improvise and prepare teaching and learning materials using the locally available materials.

> Inadequate teaching and learning materials such as science kits, textbooks and other reference books limit the learners' thinking and creativity. I usually teach theoretically, and the learners do no experiments. Because I do not have any required materials to support my teaching and make the learners interact during the lessons, it limits their scientific and independent thinking. Through experiments they would develop their thinking abilities, scientific knowledge and skills, and be able to work independently. Furthermore, inadequate textbooks may cause memorization of facts because the learners depend only on copying notes which I write on the chalkboard. In addition, the learners do not get any chance to think on their own about what they have learned and to build new concepts (Hawa, 12 years' experience).

Hawa's experiences depict her thoughts about inadequate science teaching materials to support her teaching. She feels that a lack of teaching materials creates a dependency habit among learners. Indirectly, she raised the issue of rote learning, which she linked to copying notes from the textbooks. In this kind of teaching, learning is memorizing, and sometimes a reproducing pattern that the learners have to follow is

developed. In most cases, learners become passive listeners because they do not practice.

Domati's experiences in her Kiswahili class of 83 learners illustrate the problem of inadequate textbooks. The issue that makes her experience different from that of Hawa is that she focuses on teachers' planning in relation to learners' achievements. Domati noticed that because learners do not have books to interact with and support the promotion of literacy skills, they normally lag behind and complete primary education without basic knowledge of literacy skills.

> I have difficult in planning reading lessons due to inadequate textbooks. The learners fail to share the few copies provided by the school, especially during reading lessons. They fail to practice what they have learned using textbooks to improve reading and writing. Since they do not practice, they tend to forget even the few skills acquired and find the lessons difficult. The result is a lack of basic literacy skills for the development of language as a basic requirement for lesson success. This could be one reason for some learners completing primary education without acquiring adequate literacy skills. This may increase the illiteracy rates in the community (Domati, 12 years' experience).

The experiences that Domati expresses remind teachers and policy makers at different levels of the importance of adequate textbooks in the teaching and learning process, particularly for literacy skills development. Her emphasis is on the development of reading and writing skills as a basis for understanding languages and other subjects. She feels that practicing is vital for the acquisition of skills. With few books it becomes difficult for learners to get involved in the lesson throughout the session and to interact with one other.

Lack of teaching materials and textbooks in particular, is a challenge to the majority of teachers in Tanzania, because it limits classroom actions. As a result, learners complete primary education without the acquired basic literacy skills (UWEZO, 2010). Since teachers seem to depend solely on the few available textbooks, they feel that a lack of textbooks affects their teaching.

6.1.3 Teachers' professional constraints

Having articulated and concentrated on issues related to contextual constraints, in this third category I asked teachers to describe their experiences regarding the constraints of their profession. The teachers described their experiences of professional constraints in terms of inadequacy in their teaching due to lack of subject matter knowledge, pedagogical knowledge and pedagogical content knowledge. Teachers' experiences in this category seem to reflect on three aspects: inadequate content knowledge, inadequate pedagogical knowledge and inadequate pedagogical content knowledge. The three components seem to have a negative impact on the teachers and on the learners' learning outcomes (see Figure 12).

Inadequate content knowledge: The teachers' experiences revealed that they do not know the subject matter content well. They described the challenges they encounter due to inadequate subject content knowledge. Their experiences indicate loneliness in doing their work. The majority have been working in isolation and this has created a tendency of being afraid of asking and seeking help from colleagues. Working alone has created lack of confidence in their work.

Working in isolation has made Ally with 68 learners in his science class fail to work together with his colleagues to solve the challenges he faces, which are related to inadequate subject content knowledge.

> Before attending the EQUIP courses, it was difficult to ask questions to my colleagues on difficult subject content because I did not want anyone to know my weakness, that I am incompetent. I used to skip some topics or themes that I did not understand. It was a shame to ask or say that I did not know the content of the subject matter which I studied in secondary school. Therefore, I tried to do whatever I could to make things go well without seeking any help (Ally, 15 years' experience).

From Ally's experiences it appears that the EQUIP program has opened his mind to the importance of teachers working together, working in a team and supporting each other in the teaching process. Working in isolation made Ally to hide his weaknesses or incompetence in

knowledge of the subject matter. His assumption was that perhaps he might not get any help and support from his colleagues.

In a similar way, Dorotea's experience indicated that she has been trying to plan the lessons to meet the learners' needs. Because of poor knowledge of the subject content, the learners copied notes without getting any help in understanding the content from the teacher. She addressed

> I have been fumbling about to ensure that I plan my standard six science lesson and meet the learners' needs. However, some topics seem to be difficult and I fail even to get the meaning or the concept to communicate with the learners: for instance, a topic on 'energy, machines and work' (Nishati, Mashine na Kazi). The topic needs materials, which are not available here at my school and knowledge of formulae to support experiments and do some mathematical calculations, which I do not have because I did not study science in secondary school. In such a case, I have been just copying notes on the chalkboard in the way they are in the textbook and the learners have been copying the notes into their exercise books (Dorotea, 10 years' experience).

Dorotea described inadequate subject content knowledge which is frustrating when teachers struggle to teach subjects which they did not study in secondary school. This is obvious in Tanzania, where primary school teachers are required to teach all subjects taught in primary schools. There is no specialisation, even if the subject needing to be taught was not of their subjects in secondary school. The assumption is that after undergoing teacher education the teachers will be able to teach all subjects. Furthermore, it shows how Dorotea has been trying to hide her weakness in subject content mastery, and has been trying to teach without knowledge of the subject content. Inadequate content knowledge can also affect teachers' pedagogical knowledge, which I present in the next aspect.

Inadequate pedagogical knowledge: The teachers revealed constraints in teaching due to poor pedagogical knowledge. Through observation, we noted that some teachers still use lectures as their major teaching method accompanied by choral response. In this case, the constraints were noted

to be poor ability to organize and present subject content through the lecture method, in asking questions, in responding to learners' worries or concerns and in the planning of activities.

Sophia's experiences describe difficulties in presenting the subject content through the selected teaching method (lecture) and engaging all 71 learners in learning Swahili in her class. Sophia stated that the most prominent method of teaching was lecturing, which seems to limit language practice.

> I used to talk more than three quarters of the lesson time and I hardly gave the learners time to interact among themselves and share their views. I considered myself the only source of knowledge, and the main speaker during the lesson. My teaching aimed to present my topics and there was no time and room to discuss with the learners about the lesson (Sophia, 22 years' experience).

According to Sophia's experience, the teacher is the only source of knowledge. Her experience of teaching focuses on the accomplishment of subject content planned for that specific lesson rather than the understanding of the learners. She uses a lecture method, which perhaps does not involve the majority in the learning process. This way of teaching suggests that the teachers have inadequate pedagogical knowledge for delivering the subject content and the ability to translate and encourage learners to take part in their learning.

In a similar way, Edda's experiences of teaching 83 learners in her class create a challenging environment. Her experiences suggest two phases. The first is before the EQUIP program, where the teaching was teacher-centred, and the second during the EQUIP program, where development towards learner-centred learning began. In connection with her experiences, she indicates awareness of teaching and of the importance of teachers' professional development focusing on learners' needs.

> Well, I have realized that before attending the EQUIP training my teaching focused on accomplishing my work plan. I had no time to listen and discuss with learners. I usually lectured, and sometimes I applied a question and answer method. The learners used to copy notes from the

chalkboard, though this was not deliberately done. At least now, I can teach and make learners interact and get interested in the lesson. I try to use the Think individually, think in Pair and Share in group method. TPS gives the learners the opportunity to think about the questions. I ask individuals, and then they share in pairs or across their seats and agree on what to take and what not to, and then they discuss in bigger groups of six to 10 and present their summaries. However, there are still some challenges in meeting the learners' learning needs because the class is overcrowded (Edda, 7 years' experience).

From Edda's experiences, one can see that professional development for teachers is important because it can improve their teaching actions. The statement suggests the importance of teacher development, as well as emphasising on the difficulties of teaching a large class like hers. However, she feels that for instructional methods to be useful the teacher has to master the subject matter.

Restricted planning: Another aspect that teachers expressed was restricted planning. Planning as part of pedagogical knowledge has great impact on their work. Both Della and Thomas encountered challenges in planning their lessons. Absenteeism affects the teachers' planning to meet the needs of diverse learners in large classrooms. The major problem pointed out is how to connect the current lessons to the previous ones. Della experienced truancy as a threatening factor that affects planning in her standard V science class 68 learners. This can be seen in the next statement.

In the course of planning, I came to learn that truancy creates learning variations, which are not easy to cover in terms of lesson understanding, planning and delivery. I get problems in planning and supporting learners who do not attend school every day. In some cases, I have needed to repeat the lesson. To repeat a lesson has its implications for those who attend every day; it means delaying their progress or giving extra work, which is impossible. Bearing this in mind, in some cases I just ignore the absentees and continue with the lesson plan, though I understand that they need help. I cannot help them during the normal lessons since there are many in need of help (Della, 18 years' experience).

Della described the difficulties she faces in planning to meet the needs of her learners. The truants in particular are problematic because they are in and out of school. This also affects those who attend school every day, because in some cases she has to repeat the lesson. As such, truancy creates difficulties in planning and in learners' understanding of the subject matter content.

Similarly, Kashinde in standard V mathematics class 72 learners went further in looking at the outcomes where some learners lack basic skills on completion of their primary education cycle.

> Truancy creates differences in learners' understanding of the subjects, since those who attend every day are ahead of those who do not. The non-attendance sometimes means lessons have to be repeated and are uninteresting. It is difficult to plan for those who do not attend and as the result they lag behind and lose interest in continuing with schooling because of low performance. Some complete seven years of primary education without having acquired the basic skills of writing, reading and arithmetic (Kashinde, 10 years' experience).

Kashinde talked about the difficulties he faces in the selection of teaching methods that may fit the variations of learners in the class caused by absenteeism and low achieving without demoralising those who attend school every day. He finds it to be a challenge in planning.

To conclude, the majority of the teachers experienced interactional, contextual, and pedagogical constraints. Large classes and lack of teaching materials seem to affect most classes and teachers' work in meeting the learners' needs. Other factors expressed were inadequate content knowledge, pedagogical knowledge and pedagogical content knowledge, which included low understanding and use of teaching methods, realisation and selection of activities, and resources to use in a particular lesson as described by the participating teachers. The teachers, thus, realize the difficulties of teaching large classes that need improvement through professional development activities.

6.2 Teachers' experiences of actions taken for improvement

Based on the teachers' experiences, research question two deals in detail with the three categories; *expanded interaction*, *expanded use of the context* and *expanded teachers' role.* The research question was "how have teachers improved their classroom actions after undergoing pedagogical in-service courses?" It was essential to raise this kind of question in looking for the teachers' experiences after identifying the constraints of teaching before joining the EQUIP program. In this context, I have used the notion expanded to indicate actions taken for improvement in teaching after participating in professional development courses.

In the previous category (6.1) under research question one I discussed interaction, the use of context and teachers' role. The focus was on teachers' explanations of what they perceived as constraints in their work. Under this category, teachers' experiences were about changes in attitudes, practices of their teaching because of professional development courses attended. The descriptions of teachers are taken as solutions to the constraints, though, of course, they are not straightforward solutions. The names of the categories and aspects are similar to those of the constraints, but with more focus on improvement of the phenomena. Figure 14 shows an outline of categories and aspects.

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┌─────────────────────┐
│ Teaching actions    │
│ taken for           │
│ improvement         │
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Expanded interaction

- Change in teachers' attitude towards meeting learners' learning needs
- Change in teachers' attitude towards managing classroom
- Change in teachers' attitude towards encouraging learners

Expanded utilization of the context

- Appropriate use of the environment
- Appropriate use of teaching and learning materials

Expanded professional roles

- Improved content knowledge
- Improved pedagogical knowledge
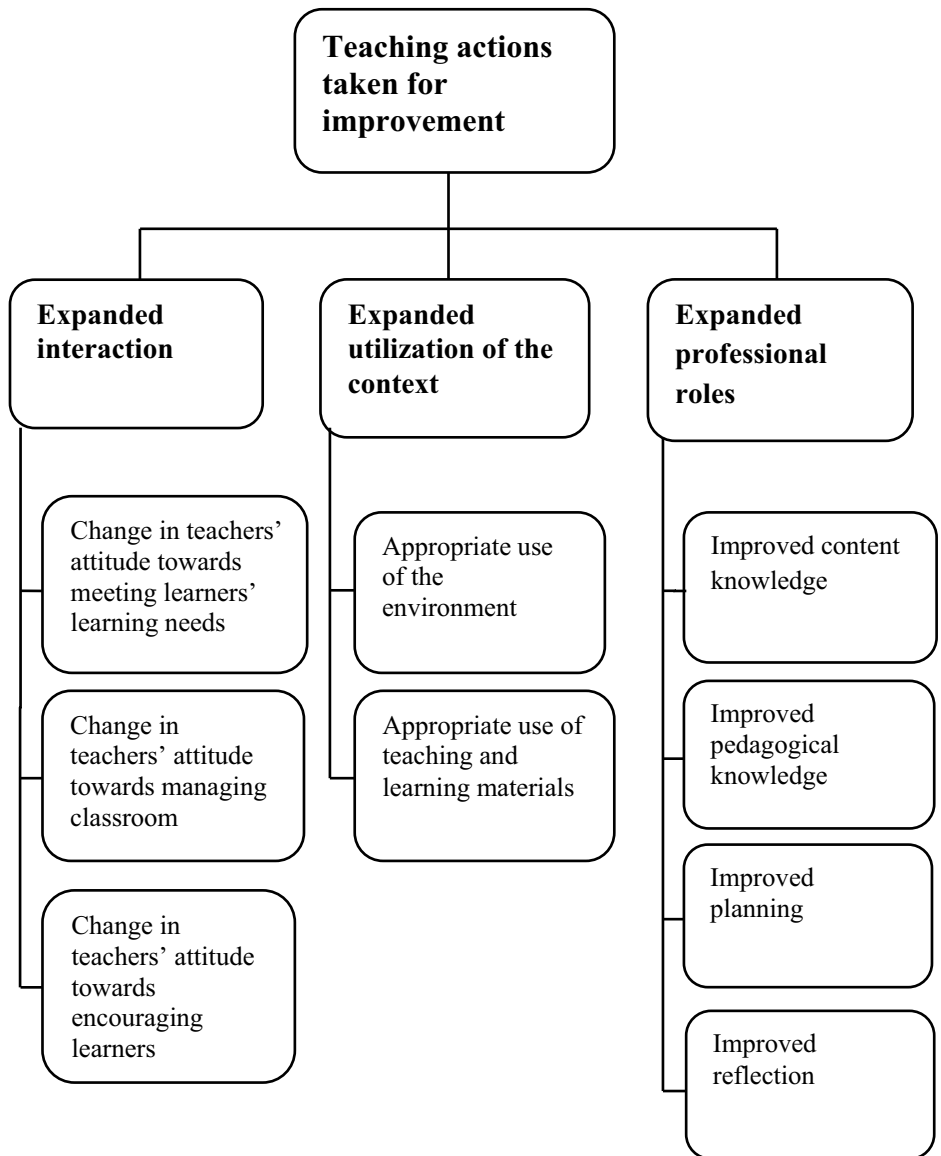- Improved planning
- Improved reflection

Figure 14. Overview of categories and aspects of actions taken for improvement

6.2.1 Expanded interaction in teaching

In this category, discussion focuses on teachers' expanded classroom interaction. Teachers perceived the notion of interaction as face-to-face action used in various activities in the classroom to make both the learners and teachers communicate and meet the intended objectives. The participating teachers perceive expanded interaction as increased communication and contacts between the learners and teachers, and among the learners themselves.

Change in teachers' attitude towards meeting learners' learning needs: In 6.1 the teachers expressed many constraints restricting them from meeting the learners' learning needs. They described actions taken for improvement in meeting the learners' learning needs in large classes. The notion learner's learning needs in this study refers to understanding of skills, knowledge and competences.

Dorotea's first experience in 6.1.3 was connected to poor content knowledge of the subject, which made her fail to support learners in her class. However, in this section on expanded interaction, research question two after the phase one interview, and after attending professional development courses for four years in the EQUIP program, Dorotea's experiences show changes in attitude towards meeting the learners' learning needs. She is able now to manage her class and make use of appropriate teaching methods. Her experiences focus on application of various teaching methods.

> I use different methods in teaching my lessons, such as group discussion, jigsaws, brainstorming and think individually, pair and share in small groups-(TPS), which motivate and enable learners to participate. Before the EQUIP training, I used to apply mainly question and answers and lecturing (Dorotea, 10 years' experience).

As we see, Dorotea experienced a change in attitude towards teaching and learning. The use of different teaching methods engaged the learners. Indeed, the mastering and application of teaching methods that make learners participate in their learning is visible in her descriptions. This also suggests the importance of further professional development courses

she attended in order to improve teaching. In an interesting way, Dorotea continued expressing a need for raising confidence in girls in order for them to participate in the learning process. She described further how she has been working with girls in her class in order to make them learn and gave examples on improved teaching in her second interview:

> I give them more examples and exercises that encourage participation during group discussion. I also encourage them to participate in demonstrations on the chalkboard while others assist step-by-step. Most girls now are motivated, encouraged and engaged in the learning process (Dorotea, 10 years' experience).

Dorotea's experiences indicate enthusiasm in helping and supporting girls to learn. Her description indicates ways she has been employing methods in working together with girls in performing different activities in the classrooms and raising their motivation in learning.

During phase two, Makunda also expressed a change in attitude towards teaching. She was able to make learners learn by applying a range of teaching methods and improved learner to learner interaction through group discussion and use of methods that allow pair sharing like TPS. Like Dorotea, her emphasis was on getting learners involved, but Makunda emphasised also the promotion of learners' confidence and thinking abilities.

> I apply group discussion, questions and answers in trying to meet each learner in the classroom and promote their confidence and thinking abilities. Most of the time I try to choose a method that will make learners interact among themselves, for instance, individual thinking, pair and share in groups (TPS), question and answers and gallery walk, where learners are supposed to explain to their peers the process or how they reach to a conclusion. These different methods make the majority of learners benefit from learning. The methods involve learners in various activities that make them enjoy the lesson. However, it is difficult to make all succeed in a large class like mine (Makunda, 14 years' experience).

Both Dorotea and Makunda assert that the proper selection of teaching methods creates a learning environment in which learners are part of the learning process. The teachers explained that they have been applying

interactive teaching methods to motivate learners' participation and involvement in learning, as well as increase their confidence and thinking abilities. The challenge is still how to make all the learners in large classes benefit from their teachers.

Moreover, Edda described the way she is trying to address the challenges of choral answering by focusing more on individual learners. Her understanding of individualized learning in meeting learners' needs is in directing questions to individual learners and calling them by name as well as organizing peer assistance. Edda has engaged learners in all actions such as asking and answering questions and responding to statements. These actions are based on the teacher's practical knowledge. The teacher's practical knowledge differs from one teacher to another because it is personally bound. Thus, managing individualized learning depends on the teacher, how she/he values individual learning. This is clear in Edda's experience:

> I call a learner by her or his name when I want her or him to answer a question, and even when she or he asks in order to avoid choral answers. This has been a kind of motivation to the majority. I understand choral answering does not involve all learners. Those who are not capable of understanding what I have taught are left behind with no assistance. Calling a learner by her or his name makes her or him be aware and attentive throughout the lesson. For the majority it develops their thinking ability, though for some may it may create a sense of fear and loss of interest (Edda, 7 years' experience).

Edda's descriptions of her experiences show the significance of calling learners by their names and the fact that it encourages and keeps them alert to what is going on in the classroom. Individualized learning goes well if every learner is counted differently and learns differently from others. It also promotes and develops the learners' thinking abilities. However, it can suppress the efforts of the low achievers, especially when they fail to cope with the learning and the teachers do not assist them.

In an interesting way, Tesha 81 learners in his math class in trying to meet learner's needs, considers individualized learning based on ways he interacts with individual learners. He seems to understand his learners

more through questions. Tesha hopes to bring about change in his classroom:

> My life in the classroom has changed. I am more concerned with the individual learner. I ask questions directed at individuals to help me to know their learning needs and understand their prior knowledge of the lesson. Moreover, questions make them aware of what they are going to learn. Although not all are able to answer the questions asked, at least each one in the class is aware of their learning. I have organized my class in such a way that those who do not cope well with the lessons are assisted by their peers during the lesson and in the evening outside school hours (Tesha, 7 years' experience).

Teachers' experiences show how they address teaching to individual learners. Their descriptions indicate that one can demonstrate individualized learning in many ways that focus on providing support to individual needs. It is part of the relation where teachers have a view of how to act in teaching practise and how learners participate in learning.

Change in teachers' actions in meeting learners' learning needs serves as an essential indication towards improving learning, and hence the quality of education. The success in teaching is in the choice of methods, demonstrations and deliberate focus on specific groups such as girls and low performing learners. The participating teachers emphasised the importance of using interactive methods of teaching to facilitate learning. Moreover, all the actions taken by teachers in trying to support learners in their classrooms are indications of improved pedagogical content knowledge: not just the method, but also keenness in selecting methods to suit the nature of the content and the learners' needs that are considered important. This can help to manage class discipline, which I discuss in the next aspect.

Change in teachers' attitude towards managing the classroom: In 6.1 on restrictions in managing classrooms, the teachers focused on constraints in dealing with large classes. They described their experiences of different ways of trying to deal with large classes in order to make learners learn and minimise disciplinary problems. In this section the teachers'

experiences of classroom management focus on how teachers listen to the learners' concerns and involve them in the process of learning.

Listening was one of the actions towards achieving management of the classroom. The teachers described changes in actions by involving learners in various learning activities individually and in groups. Their experiences show that the selection and use of various teaching methods for teaching the subject content make the learners pay more attention to the lesson. The teachers acknowledged that low achievers learn better when supported by their peers. The next experience takes us to Boka's classroom of 65 learners and indicates the way he manages it in the light of her experiences:

> I assign learners some tasks to perform individually and sometime in groups. I mark their work and provide appropriate and immediate feedback on their progress. I engage the low achieving learners with the high achievers to work with them during the evening activities and I monitor their progress and provide support whenever needed. I work closely with the supporters to ensure that all get the required assistance and they capture the learning. I listen to their problems during group work. These processes make the learners work collaboratively. However, managing a large class in 40 minutes remains a challenge in learning (Boka, 17 years' experience).

Despite the challenges of managing large classes, there are different ways the teacher can use to manage them. Effective classroom management depends on the teacher's own creativity and proper planning of the lessons, and above all, meeting the individual learner's concerns. Exposing relationships, engaging and listening to learners' concerns is important when dealing with classroom management. Boka and her colleagues have tried to find various ways of motivating individual learners to participate in the learning process. His ideas provide us with more thoughts how well teachers can improve learning through praise and effect learners' engagement in their classes.

Change in teachers' attitude towards encouraging learner: When discussing solving and minimizing the constraints, the teachers emphasised teaching actions that they do differently. They expressed encouragement in terms of praising and motivating learners, as well as listening and paying attention to the learners' concerns. The descriptions vary. Some pointed out that encouragement makes learners acquire skills and participate in their learning. To others it enables the learners to contribute more and increases their freedom to ask about what they do not understand. The teachers expressed themselves strongly on the importance of recognition and respect through engagement, as described in different parts of this aspect. Limba exemplifies:

> I praise the learners' efforts in order to encourage participation in learning by acknowledging the efforts they have made. I usually use encouraging and motivating words like 'good', 'well done,' 'you have tried', 'keep it up'. These words motivate them to learn more and they feel free to contribute and ask when they get problems (Limba, 13 years' experience).

Limba's opinion illustrates that praise increases the learners' engagement and freedom in learning. The most prominent way of praising and motivating learners is in verbal praise using motivating words.

Similarly, Sara considers praise to be an important part of classroom management, as well as part of classroom motivation. Sara argues that it needs to be well organized and planned. She expressed this in an interview:

> I have organized the class to use handclaps to praise each learner's efforts made in learning to promote their interests and participation in the learning process. I also seek their prior understanding of the lesson. I encourage the low achievers by providing them with additional exercises, giving feedback and assisting them whenever they get problems. I clarify areas not understood in order for them to ask questions during group discussion and presentation. The learners ask questions and I involve the whole class in answering before I do. Because of praise, the learners now work competitively, both individually and in groups. Through encouragement, the learners feel that they are responsible for their learning (Sara, 16 years' experience).

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Sara's experiences reflect an individual and group sense of competition and learners' feeling of being self-accountable for their learning. As mentioned previously, every teacher has different experiences of the teaching and learning processes, through which she or he perceives teaching. The differences based on the teacher's experiences work as a mirror through which he or she reflects on her or his work and interprets situations in the classroom.

Edda talked about how encouragement has helped the low achieving learners excel in learning and develop closer relationships with their teachers. It also promotes learners' interests in learning and understanding their ability in doing different classroom activities. Praise is a catalyst for facilitating participation. Edda is of the opinion that when learners participate in the lesson they can easily identify their talents in performing various activities as she refers to these experiences in the second interview:

> Encouraging learners in their learning has brought them closer to the teacher because they feel that I appreciate what they do. Encouraging them to participate in various activities has helped understand their abilities, and has also helped group formation and planning of the lesson. It has also raised individual learners' level of interest and the low performing learners' engagement in their learning. This has generally raised their learning morale and attendance. Now they seem to like schooling (Edda, 7 years' experience).

From the teachers' experiences, it appears that learners learn better and progress in their learning if teachers recognize and acknowledge their efforts. Encouraging learners in the learning process enables them to work competitively. Edda's experience suggests that encouragement is essential for creating a sense of self-motivation, self-responsibility and engagement in learning.

The notion engagement refers to giving space to learners to take part in the learning process. The teachers' experiences of enhanced engagement not only focus on classroom actions, but also on activities outside the classroom that help them prepare for the lessons.

The teachers acknowledged that engaging learners in class activities tends to promote a lively classroom environment and makes learning meaningful. The majority explained that they seek the learners' prior knowledge in order to connect them to new knowledge of the subject. They pointed out the importance of engaging learners in various classroom activities starting from the preparation of the lesson because they become aware of what is going on in a specific subject.

> In most cases, when I start a new topic, I start the lesson by seeking the learners' prior understanding of the topic to be taught. For example, in my mathematics lesson, I start by learners distinguishing numbers written into cards. For those who have cards, each reads the number aloud and the rest in the class imitate them. Then the one who has the card writes the number on the chalkboard, so that the rest can see it and read again repeatedly and practise writing the numbers on the chalkboard (Tesha, 7 years' experience).

The teacher has focused attention on seeking the learners' initial understanding of the lesson content and on various ways of involving them in the lesson. Some of the methods include seeking prior knowledge of the lesson and demonstrating new knowledge. The learners work in groups and on individual assignments. This has improved performance and encourages deep learning. In the same way, Hassan contends that demonstrations have improved the relationships between him and the learners and among the learners themselves. Hassan's experience of involvement has given the learners more chances of working with their peers. Hassan's experiences are expressed by the following statement.

> In my class, I have noticed that involving learners by demonstrating examples on the chalkboard and by the rest of the class following step-by-step has motivated them and each one wants to go and demonstrate before the class. I have learned that the only time that I can assist and support those who did not understand the lesson is during the demonstration process. As such, I give questions to the learners to practice on their own after the lesson (Hassan, 16 years' experience).

Hassan's experience shows that helping learners to understand how to learn through practising raises their interest, willingness and eagerness to

learn. It has also increased pedagogical content knowledge, interaction and a sense of competition has also developed in the learners.

Teachers' experiences indicate that involvement is not restricted to a certain group of learners but can be demonstrated as a way of developing relationships, of increasing interaction, improving thinking abilities, developing understanding and improving participation. The teachers have realized that involving each learner in practising new knowledge is important.

6.2.2 Expanded utilization of the context

In this category participating teachers experienced expanded use of context as a learning environment. The focus was on how teachers have improved teaching using the environment to make learning meaningful to learners. In view of the teachers' experiences, two categories emerged as *expanded use of the context*. The teachers' experiences focus not only on appropriate use of the environment, but also on the collection of raw materials to improvise and prepare teaching and learning materials. I identified two aspects: *appropriate use of the environment* and *appropriate use of teaching and learning materials,* as illustrated in Figure 14.

Appropriate use of the environment: According to Section 6.1 it seems that teachers have put little emphasis on using the environment. This might be due to their habit of depending on teaching materials provided by the government and other sources. Teachers are aware of the importance of using the environment for improving teaching and learning processes. This shows their commitment in trying to improve classroom materials, despite the large number of learners in the classes. The next description is an example of how teachers have improved their learning environment through involving learners in preparation of teaching and learning materials.

> I encourage learners to bring local materials into the classroom and then I support them in preparing and improvising some simple materials to support the learning. With materials that we cannot prepare during the lesson proceedings, I usually assign learners to prepare these at their

homes and bring them ready made to class. Using teaching and learning materials during the lesson has helped learners connect their prior knowledge with new knowledge. In most cases, not all are able to prepare and bring learning materials since they depend on the availability of raw material in their environment. In such a case, I organize learning groups and they prepare in groups (Hawa, 12 years' experience).

In addition to connecting to prior knowledge, Makunga's experiences of her class of 71 learners, show that the process of collecting and preparing teaching and learning materials improves learners' creativity and reduces costs. She emphasises using locally available materials to promote learners' creativity and innovations.

I involve learners in collecting materials from their environment and we prepare and improvise teaching and learning materials with what they have brought. It is not necessary to buy them from the shop. It is cheaper to have teaching materials made from local materials collected in our environment. Through these processes, it is easier to identify and develop learners' talents, and in so doing they are likely to improve their skills (Makunga, 12 years' experience).

Makunga perceived use of the students' environment for learning as an important phenomenon where there is a possibility of improving learners' skills. However, she has not mentioned which skills to develop. The process of involving learners on the use of the environment depends on the teacher's creative thinking, interest and commitment to wanting to improve her teaching.

Appropriate use of teaching materials: In 6.1.2 the teachers' experiences of inadequate teaching materials were illuminated. The teachers' experience indicated the importance of teaching materials and show that the proper selection of teaching materials keeps learners active throughout the lesson and supports students with different needs. The teachers' experiences are expressed by the following statement:

I have been frequently attending the EQUIP trainings. These have improved my ways of planning activities, including guiding on the proper selection and use of teaching materials. The selection of teaching materials guides the selection of classroom activities and the instructional

teaching methods. Now my class is more interactive throughout the lesson than it was before attending the EQUIP courses. Since I improved my preparation and use of teaching materials, I am confident in teaching and supporting learners in their learning needs. The learners are motivated and interested in learning and can share what they know with their peers (Sele, 15 years' experience).

Like Sele, who benefited from the EQUIP training, also Atu's experiences of phase two of data gathering reflect on giving the learners room to interact through selected teaching materials and working in various activities related to the subject matter. Attu emphasised planning. She argues that with the necessary materials in place, learners are motivated to learn. Her experience shows that appropriate selection of teaching materials, such as illustrative teaching materials and self-made drawings, are important in making learners learn. She also indicates that teaching materials promote understanding of the content because learners get a chance to interact. The following description exemplifies Attu's experiences of improved use of teaching and learning materials.

I have been selecting teaching and learning materials that learners can easily use and which make the class active. Selection of teaching and learning materials sometimes has directed me to the selection of the instructional teaching methods. With those who need my help I use the materials in the classroom to illustrate more. Sometimes I use questions to let them understand the topic concepts. What I have noticed since I started using adequate materials in my lessons is that learners are more engaged and their ability to capture subject content has increased (Atu, 21 years).

Using teaching materials in teaching has a big impact on learning outcomes. Sele and Atu both acknowledge that they have improved their skills in using teaching materials in their lessons. They have also promoted classroom interaction and stimulated learners' learning through increased participation. Their experience also illustrates how the use of teaching materials has permeated a sense of independent learning and interaction between the teacher and the learners and among learners.

6.2.3 Teachers' expanded professional role

The participating teachers expressed their professional role in teaching as responsibility for the improving of teaching. The teachers' expanded professional role means improving their understanding of teaching methods that involve practice. When compared with the previous expanded use of the environment this category to some extent depends on the use of environment for material production and utility. I could identify four aspects as experienced by the participating teachers: *improved subject matter knowledge, improved pedagogical knowledge, improved planning* and *improved reflection.* It was not easy for the teachers to talk about their own challenges or weaknesses, showing differences before and after the EQUIP training, but to some extent they eagerly described changes experienced. I have dealt with each of the aspects separately in the following sections.

Improved content knowledge: In 6.1 the teachers' experiences indicated that inadequate content knowledge created gaps in understanding some topics and organisation of the lessons. However, in this aspect, the teachers' experiences reflect improved mastery of the content knowledge. The teachers explained that the EQUIP project has also helped them to improve their knowledge of subject content. They acknowledged the importance of professional development for improving teaching and argue that to improve content knowledge is important because learners can then get appropriate knowledge and skills needed for future life.

Tina's experiences show improved content knowledge in relation to the selection and planning of activities and organizing the subject content to allow systematic teaching.

> Now I can organize the subject content well, teach logically and make the learners follow the lesson more easily than before the EQUIP courses. I identify and select appropriate content for my subject and the methods to use. In fact, if one knows the subject well it also guides the selection of teaching methods and the learning tasks for the teacher and learners. The subject content and the method lead to the choice of learners' activities (Tina, 16 years' experience).

The picture that I get from Tina's experiences is that improving teachers' subject content has helped her generate a sense of confidence and the power of her teaching. In other words, Tina understands the importance of participating in professional development courses and the way this has changed her teaching actions. The issue of content knowledge was deemed imperative to Tina's work.

Improved pedagogical knowledge: The teachers considered improving teaching methods as one role of their work. In 6.1 on pedagogical knowledge constraints, the teachers reported a number of constraints that impede their teaching actions. In this section, the teachers describe their increased ability in teaching after attending EQUIP in-service pedagogical courses.

The previous aspect, improved content knowledge considers the potential of Tesha's work in promoting professional development. This was observed six months later during the second phase of data collection. She reflected on her experiences and stated factors noticed in her teaching, particularly in improved instructional methods. Tesha increased her pedagogical knowledge and confidence in using various teaching methods.

> Now I can teach and use a range of interactive methods in my lesson, which include questions and answers, discussions, demonstration and think, pair and share (TPS), instead of using just lecturing, as I used to do before the EQUIP training. By using different methods I am able to involve many learners to participate in the lesson. It has also increased the learners' interaction. They have become more active and seem to like the lessons. I also encourage and involve individuals to participate in the learning process by demonstrating examples on the chalkboard (Tesha, 7 years' experience).

In a similar way, Dorotea's experiences of improved teaching are related to pedagogical knowledge. Her experiences reflect the applying of instructional methods according to the purpose and dimensions of learning. She selects teaching methods to suit the nature of the subject content and also views the class as central in guiding the whole process of her teaching.

I use various instructional teaching methods for different purposes in my lesson. For example, I use brainstorming for exploring learner prior knowledge. That is, what do the learners understand about the topic that I want to teach? Using question and answer for seeking information and clarity from the learners, group discussion and experiments for promoting critical thinking, and through working in groups they are able to share their experience and come up with a summary for presentation. Thus, a combination of these teaching methods in a single period engages the learners actively in the learning processes (Dorotea, 10 years' experience).

The most important thing for Dorotea is not the mastery of the teaching methods, but their application. We can see how the pedagogical relation in her teaching actions is visible in the way she considers the situation from the learners' developmental growth point of view. The improvement is associated with pedagogical content knowledge in selection, application and understanding of the teaching methods in different parts of the lesson.

After the first phase of data collection those teachers involved in professional development courses showed a significant change in their teaching. The significance of improving pedagogical knowledge is that the teachers are no longer working in isolation. They reflect on their experiences towards establishing team teaching. Teams have common interests and support each other in teaching and learning. The team can make teaching possible by enabling, facilitating and supporting activities and sometimes demonstrating. The next excerpt explains Mutwa's experiences in a class of 72 learners.

EQUIP has brought us together. Now we can solve our teaching problems through discussion. There is more unity and cooperation amongst us teachers. The trainings organized by EQUIP have promoted my confidence. I am not afraid any more to ask my fellow teachers about difficult areas of the subject. The introduction of mentors also has helped me discuss issues without fear. On difficult areas, we plan together and then I teach, while the mentor observes and writes comments on both strong and weak areas that need improvement.

After the lesson, we sit and reflect on the notes gathered during the lesson; we find solutions together and sometimes teach as a team. I

suggest ways to improve and we agree on a way forward for the next meeting. Teachers who are knowledgeable in certain teaching methods demonstrate how they teach. We all now see the importance of helping each other. These processes have improved my teaching abilities. The challenge remains in getting all teachers involved and working together as a team (Mutwa 19 years' experience).

Mutwa's experiences show how the majority of teachers in his school have changed their ways of communicating and teaching after attending the EQUIP professional development courses. It seems that before EQUIP, teachers within the project area were not working cooperatively. This was also noticed in Ally's description of content knowledge constraints, since before joining the EQUIP program he was not able to ask about difficult topics. Teachers now are willing to work together in assisting each other in order to solve teaching challenges they are facing. According to the teachers' experiences of EQUIP, the professional development courses have improved their teaching abilities and social engagement in teaching. It has also promoted relationships in helping each other. The teachers have gained more confidence, they are open and willing to share their teaching challenges and find ways to enhance their teaching. However, pedagogical knowledge alone does not guarantee improvement of classroom actions, but rather depends also on other factors such as content knowledge and pedagogical content knowledge.

Improved planning to meet the diverse of learners' learning needs: In 6.1, the teachers experienced challenges in planning that make it difficult meet the diverse population of learners with different levels of understanding. The teachers' experiences focused on improving planning as one of their roles.

It is clear that Edda's experiences bring in the idea of didactical relations, where the teachers, leaner and content are basic components of the classroom actions. Her focus is on the learner.

> The EQUIP courses have enabled me to analyze needs for the learners, plan my lesson in focusing on the learner's identified learning needs. I usually plan based on understanding the learners and the content to be taught. The courses attended on curriculum analysis and on instructional

teaching methods, for example, have increased my understanding of the learner, content and the methods needed to deliver the content. Now I can plan and teach the lessons with more confidence than before, because I know what my roles are in the classroom. I understand the learners' roles and abilities and the subject content needed for the learners. However, the problem is still in how to help truants cope with learning in a large class since they are behind schedule: (Edda, 7 years' experience).

Edda's experiences of the didactical relation anchors on the view of how she teaches her subject and makes it clear to the learners. In this understanding, the didactical relation is associated with pedagogical content knowledge. Planning depends much on understanding of the content, and the professional development courses offered to teachers have helped her to assess performance through reflection '*in* and *on*' action in her work (Schon, 1983; 1987).

Improved capacity to reflect: Reflection is a way of understanding the progress, and finding ways of improving teaching. The respondents consider reflection as a tool for monitoring and evaluating their teaching and learning actions, generally for regulating their work. Through reflection, they are able to identify appropriate teaching methods for the learners and make informed decisions for improving classroom actions. The next statement pictures Edda's experiences.

> I reflect on and question my teaching methods and the way I interact with the learners. This helps me to identify learners who need support in their learning and also understand my weaknesses in teaching and find ways to improve (Edda, 7 years' experience).

Reflection can be referred to as looking at our experiences connected with our feelings and accomplishing self-evaluation. Maria considers reflection as a means of unfolding her own assessment to improve her classroom actions. She assesses her teaching methods and the way she interacts with the learners. These processes help her to identify learners who need individual support and to think back about what she has done in order to identify strengths and weaknesses and to plan for improved actions.

I reflect on my lesson to see how I have taught and think of ways of improving. Reflection informs me of whether to continue with the lesson or not and whether to continue with another topic in the next session or to repeat the same topic to those who did not understand. The result of reflection sometime leads to change in my teaching methods and group arrangement (Maria, 15 years' experience).

Maria seems to understand her teaching more deeply through reflection and the ways learners grasp the subject content. As far as teaching is concerned, she perceives reflection as looking at what she does in the classroom, thinking about why she does it, reflecting on whether it has worked or not and giving reasons for the answers. For her, reflection allows modifications to her teaching plans and during the teaching process.

In the same context, Vero argues that reflection does not always mean an indication only of classroom successes, but something that she uses to guide remedial teaching after classroom actions and reactions. Vero realised the importance of reflection as a developmental action:

I reflect on my practice in order to understand what the learners have learned. In addition, it helps me think of other alternative ways of making the lesson interesting. In so doing, I assess whether I have achieved the intended objective or not. That is, I ask myself questions such as: have the learners acquired the desired knowledge and skills? If not, then what next? I find other ways to make those who did not understand the lesson benefit and cope with the rest of the class. The challenge is still to work with the big number of learners in the classroom (Vero, 11 years' experience).

Teachers experienced reflection in different ways; however, all have the element of looking back on their actions, asking questions about 'what,' 'how' and 'why'. The majority of the teachers have shown the importance of reflection on their work as a fundamental requirement for improving their teaching and learning. It is a mirror and a tool for understanding one's self-actions and the general environment in the classroom.

6.3 Characteristic phenomena, types and narratives

When looking across the categories I could identify two apparent types of *phenomena* that cause critical constraints to teachers' work, and three *individual teacher character types*. The first *phenomenon* responds to teaching constraints brought about by class size in the context of the teachers' work. The second type is linked to the lack of teaching and learning materials. *The individual teacher character types* were identified according to the teachers' experiences. Two of these types are descriptive factors on improved actions as a result of participating in the EQUIP program. The third teacher character type expresses experiences of frustration caused by class size and the lack of teaching materials, regardless of participation in the professional development courses offered by EQUIP.

6.3.1 Types of phenomena

The main phenomena were related to class size and lack of teaching and learning materials. When there are more than forty learners in a class, it restricts the teaching and learning process in different ways. Inequalities of different kinds also begin to affect the teaching and learning processes (UNESCO, 2004). Under each type, there are reasons explaining the characteristics of the phenomena.

Class size as a critical constraint to teachers' work: The notion class size as defined in Chapter 3 causes restrictions in teachers' ways of working**.** There are many other problems that teachers experience closely related to class size beside the ones explained in 6.1. However, I have identified three for further understanding: *restrictions in teacher's ways of working, gender inequality* and *restrictions in communication*. The identified phenomena seem to have significant impact on teachers' work, and at the same time affect learners' learning (Kinchin & Hay, 2000; UNESCO, 2003).

One of the biggest obstacles that make teachers fail to connect with other teachers is large class size. Teachers have no time to interact due to a heavy marking load. It is difficult to get all teachers acting together to

build relationships and to find steps to take in improving the quality of teaching in large classes. Large classes also affect ways of involving each learner in the learning process. Susan experiences, in a class of 88 learners, a situation where she is just working with a few learners who are capable of following the lecturing. Susan focuses her teaching on accomplishment of the syllabus.

> "....I hardly pay any significant attention to the low achievers during teaching, because it would mean failure to accomplish my lesson plan. I just lecture and afterwards write few notes on the chalkboard which the learners copy into their exercise books" (Susan, 16 years' experience).

This could be interpreted as linked to practical possibilities, which teachers cannot avoid. In a real situation of having 88 learners in a class, it seems impossible for one teacher to teach all learners effectively within forty minutes. The effects of these practices push learners into memorization of facts (Mayer, 2002). The low achieving learners are affected more than the high achievers because they fail to follow and capture learning.

It seems that teachers are distanced from their colleagues. They spend much of their time working in isolation, making it difficult for them to work together to solve classroom problems. Working together on a lesson plan can be a great way for teachers to build quality lessons for their learners and open doors for them to work together. There is no reason why teachers in large classes have to solve problems of teaching by themselves.

Working together on a common goal also fosters unity. Perhaps teachers have to seek out other teachers for advice and work together to find permanent solutions to difficult issues. Ndee, with 81 learners in his class, described his experiences of the situation before and after he engaged in the EQUIP program: *I used to go in the class, and worked on one or two examples on the chalkboard. It was difficult to involve individual learners.* After participating in the EQUIP courses, his teaching was significantly changed in terms of teaching practices and learning.

Teachers have unique knowledge and skills of teaching methods and a knowledge base of the subject content that could be worth sharing with others. Through sharing the lesson content teachers can draw on their experiences of what works and does not work so well for them, as well as what makes learners experience difficulties in their learning. From the teachers' experiences, one of the difficulties in connecting with their colleagues was to seek help. This would have fostered strong connections with other teachers in their own schools and even beyond their schools.

Class size causes gender inequality: There are many reasons for concern about gender inequality some of them already explained in 3.2.2. These could be the low expectations of girls themselves, if they are discouraged from speaking, if the learning environment does not support equal access to education, and the low expectations of teachers regarding the intellectual ability of girls (Aikman & Unterhalter, 2005).

In this study, gender inequality is discussed based on large class size. Because classrooms are congested, those who do not raise hands are left behind with no support, causing classroom gender inequalities in favouring boys. A large and congested class furthermore causes insufficiency in the classroom infrastructures which also causes gender inequality because boys tend to use force to procure the scarce equipment (Sharma, 2003). The inadequate classroom infrastructures affect girls more than boys.

> Most of girls sit on the floor due to lack of desks. Because the boys sometimes use power, they rush to sit at the few available desks and leaving the girls to sit on the floor. Some girls (with age) in the upper grades find it difficult to sit on the floor and this causes some of them to drop out of school. Those who continue sitting on the floor find it difficult to stand up and answer questions or contribute to the lesson. As such, they lag behind because of limited participation (Boka, 17 years' experience)

This situation may create an unfriendly learning environment, especially for girls. Because of existing cultural norms and beliefs, teachers tend to favour boys if schools have failed to create gender-neutral learning environments. Both the teachers and the community know this and are

aware of the consequences, but they tend to treat boys and girls differently, though no measures are suggested to overcome the situation.

Furthermore, families treat boys and girls differently, causing gender inequality in the home. Different treatment of boys and girls in the home is indirectly reflected in schools and in classrooms. Teachers also tend to treat boys and girls differently because of gender blindness based on cultural norms. There are cultural practices that impede the attendance and performance of girls at school (UNESCO, 2003).

Division of labour in households sharply affects the relative chances of girls and boys attending school. The results show that girls have been leaving classes in order to support their families and to find food during times of food insecurity. This increases the rate of absenteeism and dropout for girls. Boys have not been observed to help their families in this way. This suggests that boys are continuing to attend classes. Obviously, boys can then be ahead of girls academically, since more of girls' time is spent in helping their families than that of boys. The opportunity costs of girls' schooling may be greater than those of boys.

All in all, the demand on girls' time is greater than that of boys, and girls' school attendance and performance is affected more. In the end, it may affect the leadership role of girls (women) because of inadequate knowledge and skills acquired in school and leaving boys (men) to take the leadership role in society (UNESCO, 2003).

The implication of gender inequalities in schools could be explained in different ways. Sharma (2003), for instance, suggests professional development on gender sensitivity can help to understand the implication of gender inequality in schools, and find appropriate measures to minimise inequality. The use of teaching methods that will enable both girls and boys to participate equally in learning is important (Aikman & Unterhalter, 2005). The way that teachers communicate in large classes can also cause gender inequality.

Class size causes restrictions in communication: Communication in the classroom brings learners to new thinking about the subject content.

Communication in this context refers to how learners can express their thoughts verbally and even non-verbally and others understand the message. It is also how the teacher can present the subject matter content to the learners. Good communication skills affect how well a teacher manages in the classroom.

Because learners have different needs, school, classes differ from other forms of groups (Wells, 2006). Communication can serve as a unique combination of content and procedures that apply to the rules or routines needed to accomplish tasks in a classroom. This is vital to effective learning and power within a classroom environment.

The teachers indicated restrictions in communication as a lack of interaction and giving feedback to learners. Teachers teach learners through direct or indirect communication. Common teaching methods used by the majority of teachers are lecturing and choral answering, which, when extensively used, have negative effects on learners' motivation and acquisition of knowledge and skills. Learners are forced into a passive role (REPOA, 2010) and the capacity of expression is not enhanced, which affects learners negatively in their future development and in the world of work.

> Because the class is congested I have limited teaching methods to employ in such a large class of 83 learners, which would make them communicate during the lesson and promote language building expression skills (Domati, 12 years' experience).

By comparison, in small classes most teachers can foster one-to-one communication, encourage learners to articulate and reflect on their thinking, continually probe their learning needs, progress and even their background knowledge of the subject matter. However, this becomes impractical in large classes. The problem with a large class is the domination of oral presentation that sometimes does not engage learners in practical communication. In such situations the majority of the learners who do not have books do not concretely see the main materials of the learning. As a result, the communication is restricted. The consequence in the long run may affect the acquisition of basic communication skills.

Lack of teaching and learning materials: The majority of the teachers in the study recognized the importance of teaching materials in the process of teaching and learning. In this section, lack of teaching and learning materials is associated with learners' practices.

Limitation in practice: The teachers' experiences tell us that they have failed to organize practical activities for learners during the lessons or as assignments and homework. The experiences teachers have of limitations in practice is expressed based on the difficulties they face in teaching science, mathematics and language subjects, because of lack of textbooks and the nature of the classes. In addition, learners face difficulties in participating in the lesson throughout the sessions.

The teachers claimed that all the subjects require learners to practice in order to master and gain the required skills. However, the learners do not get the chance to put into practice the knowledge and skills learnt which impedes their development. Some learners in language subjects, for instance, have never seen the main content of the text that they could have followed during reading and practising sessions. This also limits the acquisition of basic literacy skills among the learners and the content of the lesson.

> In fact, the class is large so I cannot organize practice, and that makes teaching difficult to meet learners required skills. They remain without the basic skills needed to cope in their communities (Ally, 15 years' experience)

The experiences expressed by Ally have many implications for the learners in terms of engaging themselves in the learning process. The result depends too much on the teachers' notes, without practicing the new knowledge and skills. All these kinds of related problems of inadequate practice and memorization of facts were associated with this kind of limitation in practice. There is an assumption that learners who can practice do better in the classroom because they benefit in two ways: participating in the lesson and practicing what they have learned in the classroom.

Also important to note is that the majority of the teachers consider the textbook a guide to the proper selection of teaching and learning activities and instructional methods. This in turn shapes classroom practices. The participating teachers perceive the textbook as an authority. They consider it to be a key resource to rely on in teaching and nothing else will replace it. None of the teachers mentioned any other resource they can use instead of a textbook. The teachers' thoughts about textbooks and their utility are still in terms of implementing the curriculum. They said they have limited practice, for instance in language lessons and the development language due a lack of textbooks.

Limitation in practice has caused a dependency habit among the learners. Only a few get a chance to practice with others the content and skills they have at hand. This hinders classroom interaction. Evidence from the teachers' experiences in the results chapter revealed that congested classrooms and fewer textbooks is forcing teachers to teach theoretically and with barely any practice. This way of teaching does not promote creativity skills in learners.

6.3.2 Individual teacher's character types

A character is represented by its code or group **(**William & Stevenson, 2002). A character that stands as a representative of a particular class or group of people is known as a *'type'.* In this study a character type is a person representing a group of teachers with similar characteristics. Concerning professional development, teachers expressed different challenges on the one hand and achievements on the other. In this section individual teacher's character types are identified and discussed. I tried to establish certain differences between the participants interviewed and observed their lessons in the EQUIP program. Three character types were identified: *the innovative teacher, the reflective teacher* and *the frustrated teacher*.

In presenting the characters, I find it useful to elaborate using the teachers' experiences and cite some of the teachers' statements. Within the characters, teachers have been trying to cope and solve some of the constraints presented on the types of phenomena and in the main results

in (6.1, 6.2). In trying to cope with the situations some teachers found themselves in difficult situations that made them frustrated. Here, I present the individual gains and the kind of professional development attended. However, in some cases I found that they are interwoven and sometime difficult to demarcate.

The innovative teacher: The characteristic feature of an innovative teacher is associated with change towards improvement of the classroom teaching. In the study, the teachers have always been challenging their pedagogical content knowledge that led to practices of teaching and finding appropriate ways to improve. In other words, they have improved their content knowledge and pedagogical knowledge and set objectives that clearly state the kind of change they want their learners to achieve. They have also shown that learners learn by doing and are engaging them in various activities that promote their creativity and innovation skills. The teachers see motivating learners as a catalyst in improving the learning situation.

The results also revealed that innovative teachers have been creating opportunities for learners to recognize or uncover their talents and accomplishments by providing various activities that motivate them. As Halima points out that:

> I assign learners to prepare teaching and learning materials. I also help them use the materials they have prepared according to the needs during lessons (Halima, 11 years' experience).

Learning is seen as engaging the learners. Therefore, innovative teachers have been encouraging and engaging the learners to put into practice what they have been learning in the classroom. They also find it important to demonstrate to the learners how to exploit new knowledge and skills required. It is considered important to practise with the learners by involving them in all the steps of learning new knowledge and skills. The teachers try to link learning and practice, which they believe will lead to the development of cognitive skills and not simply a mastery of particular content within individual subject context. From classroom observation, I

could identify the active and proactive role of the teachers in supporting innovation activities.

However, taking into consideration the situation of class size in Tanzanian primary schools that tends to cause many constraints; teachers continue to face challenges in their teaching. The issue of enhancing teaching from less involving methods like lecturing is still very demanding. Teachers need further professional development programs and in-service support to enable them to cope with the challenges they face in large classes. Being innovative demands collective reflection.

The reflective teacher: Reflective teachers take practical actions in observing and collecting information, analyzing and explaining the lesson. The teachers in the study took actions, found out alternatives to analyze their lessons to see what worked well and what did not work well, and found ways to improve. Through the process of reflection, teachers acquire a certain experiences, which they transform into learning and the teaching processes. Reflection is both formative and summative, what Schön (1983) terms as reflection in and on action. Reflection helps teachers to move forward in order to achieve new goals with the purpose of managing learning and development. Fatuma can picture the experience of the situation as she says that she keeps on reflecting on her teaching actions in relation to what she does in the classroom. She usually questions her ways of working in relation to the learning of her learners.

> I think on what and how I have taught, and ask myself whether the learners are learning or not (Fatuma, 17 years' experience).

From Fatuma's description, the EQUIP courses attended were useful since she has improved planning and organisation through reflection. For instance, the processes of curriculum analysis deepened her understanding of the subject content, where she now can reflect on her teaching and the learning processes. This helped her to structure the teaching materials for both the learners' and the teacher's activities and the learning outcomes. Teachers are confident in planning and teaching because they understand their learners' abilities. However, the challenge is still in how to accommodate learners and teach in large classes, as emphasised in other

parts of this study. When teachers fail to get support on the challenges they face difficulties, and some become frustrated.

The frustrated teacher: Here, the teachers' experiences of teaching indicate that they are frustrated because of large classes and lack of teaching and learning materials, which are preventing success. The notion frustration can be expressed as a state of or a feeling of annoyance caused by being unable to teach effectively. Frustration may arise from challenges in fulfilling personal goals and desires.

In a way, Susan feels that teaching in a large class of 88 learners is a kind of a punishment because it challenges her work. She is forced to concentrate on the subject content instead of paying attention to the individual learners' learning. The environment also adds more frustration. She is trying to use various teaching methods that might make the learners benefit from their learning. For instance, the teacher (Susan) uses small group learning. But she claims it is not workable because the groups are big and not all learners get a chance to contribute and share their thoughts during the discussion. Susan and other teachers who fall under this aspect seem to be in a dilemma.

> It is not easy to plan for appropriate instructional methods that will reach each learner in a large class. Organization of groups is ineffective in a large class like mine with 88 learners. Even if I organize groups, the groups are still very big for them to interact with one another. In addition, if I organize smaller groups of maybe 5-6 learners, during presentation I do not reach all the groups because there are too many groups. This is a big challenge to me. For a class that does not exceed 40, perhaps using groups can be effective, but beyond that number, in classes like mine, it is absolutely difficult to use group learning. I just end up being frustrated. It is also difficult to pay attention and listen to individual learners' problems. It becomes more frustrating when I see the low achievers struggling and I cannot help them. I am withdrawn from teaching. I feel as though I am being punished when teaching in such a large class (Susan, 16 years' experience).

Susan's experiences illustrate a combination of feelings and difficulties that she faces in teaching a large class and not achieving what she

planned. Frustrations begin by not meeting the learners' learning needs and by failing to make decisions on teaching methods to benefit all learners in the classroom.

In conclusion, the teachers' views teaching and learning as a shared entity, and when they fail to meet goals become frustrated. Giving support to individual learners seems to be hard to achieve. In order to avoid frustrations, teachers ignore them and continue with what they have planned for that particular lesson. Generally, this situation can affect learners who are in need of support and perhaps the teachers' career future.

6.3.3 Teachers' narratives

Part of the results presents the narratives of two long serving teachers, partly told in their own words. A narrative is more than just putting excerpts together. Since both the teacher (the teller) and the researcher (interpreter) tell the story, both the teller and the interpreter affect the nature of the text.

A well written narrative catches the real conditions of teachers in Shinyanga district and enriches the study. What I present here is personal re-interpretations of the teachers' descriptions gathered from semi-structured interviews and from the observation done. The stories are not anticipated to be representatives of my broad study, but rather deepen understanding of the teachers' constraints and their actions for improvement.

I have selected them to represent the range of positive and negative experiences of the teachers under study. They also illustrate key issues that have emerged from the wider teachers' descriptions. Each story focuses on one specific issue, which I found to be central to the experiences of primary school teachers in Shinyanga. One narration focuses on the teaching constraints of teachers and the other on the actions for teaching improvement after attending the EQUIP in-service courses.

From the teachers' descriptions, I found there was a need to dig further into the findings and the experiences the teachers have about their work through narration. In that way, I carefully, selected two teachers (Tabu and Thomas) to represent the two research questions. The two teacher narratives discussed exemplify how narrative has been used in my study. The purpose of collecting classroom life histories from the teachers was to connect the teachers' classroom experiences and their perceptions of the constraints and the changes observed through story telling.

The narratives are a kind of life history of the teachers collected through semi-structured interviews. Through the analytic process, I was able to detect the main narrative themes within the teachers' descriptions about their classroom lives. The first is: *'Innovations have been bogged down by a class size'* this theme represents Tabu's story. The second representing Thoma's story: *'From the closed to open doors'.* In so doing, I discovered how they understood and made sense of their classroom actions. These two examples of narratives represent teachers' experiences in the two districts in Shinyanga, where the EQUIP program is being implemented. The analysis is focused on the two research questions presented in 5.1.

Innovations have been bogged down by a class size. Tabu's experiences indicate that the way she was prepared at teachers' college gives a picture of what kind of a teacher she is now, as well as representing the way she teaches. She did not acquire adequate pedagogical content knowledge during her initial pre-service education, because pedagogical content knowledge begins to develop during pre-service teacher education and continues to develop throughout during a teacher's career through professional development and experiences. This has affected her future classroom work as she will be narrating. Nineteen years of teaching in different large classes in Tanzania could mean a lot to Tabu. Her aptitude in teaching and supporting learners was always constrained and she realizes that managing large classes is difficult. Sometimes it caused withdrawal situations on her since she could not reach and help individual learners during her lessons. Her story begins when she was at teachers' college in the late 1990's.

My experiences of twenty years ago when I was at the teacher college portray my current ways of teaching. The kind of training I received (1986-1988) and the challenges that I now face in teaching I could say are the results of the two years initial teacher training in one of the Teachers' Colleges in Morogoro region. I remember when I was at teachers' college; I did very few teaching practices and was not much exposed to the classroom to acquire the necessary pedagogical knowledge and skills in various subjects. Recalling the difficulties faced during my first teaching practice, what I remember is that I did not perform well. With all the challenges I am facing in teaching now, I have never attended any kind of a course for professional growth to improve my classroom work since I graduated as a grade 'A' teacher in 1988, apart from the educational reforms that have been occurring (Tabu, 20 years' experience).

For twenty years (1989-2009) to the time of this study, Tabu has taught in three different schools in Shinyanga district with different numbers of learners in class. One had 56 and the other 65 and the one she teaches currently has 83 learners. She teaches Kiswahili in grade six. Throughout her teaching life she has felt unable to manage large classes and her teaching creativity and innovations have been bogged down by the class size, as she narrates.

All the classes that I have been teaching are large and noisy because of the limited learning activities for the learners. It is even worse to organize and monitor their work. To use active interactive methods in such classes is a challenge, since I have never been oriented on how to teach large classes. Always I use lecturing and asking questions and expecting responses from learners. In very rare cases, I have tried to use group discussion, though I found this to be less effective. The low achieving ones are hardly involved in the learning process.

I am aware of the implications for the majority of the learners. I have been using these methods because I do not have an alternative with other teaching methods to communicate the content of the subject to the learners. I cannot say that I can help each individual learner within the forty minutes. That is impossible. I am also aware of the importance and the use of interactive methods in teaching, but I hardly practice these because I am not clear of how to apply them. My main concern then is about the future of these learners (Tabu, 20 years' experience).

It is clear that Tabu's experiences show that she has a low level of understanding of content knowledge and pedagogical content knowledge, and no connection with the low achieving learners. Because of their low achievement, some learners may lose interest in continuing with schooling. As such, the rate of truancy and dropout from school are increasing. Truancy and dropout affect her plans since she cannot have more than one lesson plan in a single lesson.

Limited or lack of alternative plans tends to block the learners' efforts and they feel undermined and not assisted. When evaluating her work, Tabu feels that the major constraint to teaching is the limitation of pedagogical content knowledge to guide the selection of teaching methods, to produce active classroom engagement and participation.

Throughout her career path, Tabu seems to be withdrawn. Her withdrawal situation is due to the large classes and insufficient knowledge to cope with classroom situations. She has never achieved her goal of assisting individual learners despite being aware of the consequences. A lack of professional development courses to improve her teaching made her incompetent. Her teaching methods were characterised by memorization and citation of the content (Kamwela, 2000; Mayer, 2002).

From closed to open doors. Thomas has been teaching in Shinyanga Municipal schools for nine years (2002-2011) up to the time of this study. His current class has 81 learners. He was employed in 2002 as a grade 'A' certificate teacher. He attended his certificate course for two years in one of the Teachers' College in Morogoro region like Tabu. For the first three years of service, Thomas never attended any kind of training or seminar to improve his classroom actions in the two year at work. He started to experience changes in his professional development in 2004, after being engaged in the EQUIP program. His story starts by comparing his work before the EQUIP courses and after being engaged.

> I am delighted that the EQUIP courses attended have improved my ways of teaching. Before the EQUIP program I had a difficult time, especially teaching some of the topics. In some cases, I skipped some topics or themes that I found difficult. This was due to fear of seeking help from my

colleagues because I felt nobody was ready to listen and help. I understand the importance of developing myself for better educational results.

After attending the EQUIP in-service professional development courses in 2004 and continuing up to the time of this interview(2009), everything was open to me, and each teacher at my school is aware now of the importance of collaboration and team teaching. Now I can ask and seek support from my colleagues on difficult subject areas and sometimes we teach in teams. Now I can see the difference through working collaboratively. I consider changing my teaching methods when I find learners do not understand the lesson.

In addition, for instance, when I want to know the learners' learning needs and their prior knowledge of the topic, I use questions to individual learners. Moreover, the questions that I ask make learners aware of what they are going to learn, though not all are able to answer, but they can learn something from answers given by their peers (Thomas, 9 years' experience).

The confidence that Thomas has gained after the courses attended and participating in teamwork has enabled him to select and use a range of teaching methods in his lessons. When he uses TPS, for instance, the majority of the learners get a chance to think individually, and then they share their ideas with others.

Thomas's relationship with both the learners and fellow teachers has been enhanced. He has begun to take more responsibility in developing the learners' own learning. He has changed his approach to teaching but also supports the learners to achieve. These practices have motivated and enabled learners to participate in the learning process and learn from their peers. Thomas has improved his ways of teaching and can now reach many learners in the classroom. He involves them in various activities of the lesson, far more than before the professional development courses.

In this part of the findings, I sought to provide the experiences of two primary school teachers who participated in the interviews and lesson observation. The two stories demonstrate the range of constraints and actions taken for improvement experienced and narrated by teachers of the EQUIP program through a phenomenological study. The stories

further illustrate some of the issues which I consider central to the lives of teachers in the classroom.

Concluding remarks: Crowded classes and inadequate teaching and learning resources formed obvious material reasons for teachers' daily constraints. Behind these reasons lie, however, as the study has revealed, deeper problems related to weaknesses in the professional qualification. These problems, like superficial subject matter knowledge, and restricted and rigid repertoire of teaching methods relate to Shulman's (1986) conceptual triad of content knowledge, pedagogical content knowledge and the synthesis pedagogical content knowledge.

Against this discouraging background the EQUIP-project has provided engagement and concrete actions for improving teachers' daily practice. Excerpts and observations provide lists of concrete measures indicating that teachers seem to have gained new competences reaching beyond the time frame of the ongoing project. The surrounding has been utilized as a source for developing teaching material, teachers have been more aware of individual learners' needs, inspired to work collaboratively, and have been consciously reflecting on their action in school and class.

7 Concluding discussion

The concluding discussion suggests the importance of promoting the professional development of primary school teachers in Tanzania. The discussion is based on empirical results, evidence from the literature, supported by an analysis of the literature review. The aim of the study was to deepen the understanding of teachers' experiences of their work through exploring the classroom teaching constraints and actions taken for improvement after undergoing in-service courses in the EQUIP program.

The results of the two research questions of the study are presented in three dimensions. They describe the limiting frames in teaching on the one hand, and enabling frames showing actions taken for improvement on the other. The third dimension focuses on characteristic phenomena, types and narratives from the viewpoint of primary school teachers' experiences. The appropriateness of the methodological approach will be discussed and finally some recommendations for further study will be drawn.

7.1 Teachers' experiences of teaching constraints

As a social phenomenon, a classroom largely is concerned with social relationships that comprise interactions between learners and the teacher. In this context, the primary school teachers' experiences from their daily teaching were investigated. As explained earlier, the teaching constraints were explored and this was stated in research question one: *What do teachers experience as constraints to their work?* For the purpose of this study a constraint is perceived as any factor that limits, hinders or restricts teachers from doing better or more of whatever they strive for, which is usually better teaching and better learner outcomes.

7.1.1 Teachers' experiences of interaction constraints

Teaching can be defined as shared business between learners and the teacher in a classroom where learning takes place. In reality, the teaching structure and activities can vary based on both the learners' and the teacher's expectations and strategies applied. A classroom is seen to be a complex social system in which a teacher spends much of her/his time every day with learners (Scott, et al., 2011). As a social system, both the teacher and learners can interact in different ways, when presenting and transforming the subject content without interruptions. What do primary school teachers experience as interaction constraints to their work? And what meaning do they attach to these experiences?

The results indicate that one major challenge to teaching is represented by the *constraints to interaction.* As has been elaborated in the literature review (Chapter 3), this kind of challenge can be caused by many factors, including competences of the teachers in terms of content knowledge, pedagogical knowledge and pedagogical content knowledge, as well as management and leadership and class size (Bennell & Mukyanuzi, 2005; Finn, 2003; Wilson, 2006). The experiences of the respondents show that constraints to interaction are perceived in terms of restrictions in meeting learners' needs, managing classrooms and in encouraging learners to learn.

In restrictions in meeting the learners learning needs, the results reveal further that primary school teachers have low pedagogical knowledge and ability to demonstrate the subject content to diverse learners. The teachers' understanding of teaching is much related to the accomplishment of the curriculum, as one of the respondents expresses: '...*It is not easy to reach all learners within a 40 minute lesson'.* It is supported by many researchers that large classes make it difficult to reach the expectations of individual learners (Bennell & Mukyanuzi, 2004; Krueger & Whitmore, 2001; Sumra, 2003).

In addition, the results show no mechanisms for assessing and evaluating the learners' achievement when teaching. Another respondent asserts:

'When the whole class respond to my questions, I believe the majority are learning.' The understanding of interaction constraints regarding restriction in meeting learners' learning needs is challenging because learners have varied learning needs. Learning needs to the research respondents means knowledge of the subject matter, skills and competences to acquire. That means that teachers need to have adequate knowledge of the subject matter, pedagogical knowledge and pedagogical content knowledge to enable learners to acquire skills and competences of the lessons taught. As the organizing theme for teacher education and teachers is competence-based, interaction is built on support, recognition and acknowledgement of what learners do in the classroom. The competence-based approach focuses more on the ability to present the content of the subject effectively than just master theoretical knowledge (Meena, 2009). The question is: How could primary school teachers implement this kind of curriculum if they are not competent?

Selection of appropriate teaching methods was indicated to be a problem. It impacts those who experience such a constraint. Large class size restricts interaction with individuals and even with groups, which then produces a low level of achievement in learning (Boyd-Zaharias & Pate-Bain, 2000; Kansanen, Tirri, Meri, Krokfors, Husu & Jyrhämä, 2000; Sumra, 2003). Most of the time the teachers use lecturing and choral answering where recitation is developed. In the Sub-Saharan Africa, teachers share similar constraints of reproducing knowledge instead of constructing (Holland, Long & Regan, 2012; Thakrar, Zinn & Wolfenden, 2009). It becomes apparent that teacher professional development is vital to the success of the education system, as it enables them plan, appropriate utilisation of teaching materials, and development of teaching and learning materials, assess and evaluate learners progress and give feedback.

The learners' production of knowledge is largely based on imitation and repetition, which restricts the learners' understanding of the subject taught. Teachers' classroom practices have great influence on the learners' accomplishment of tasks. Regardless of the preparation of the teachers to manage classes, large classes have been a challenge to the majority. Some research gives evidence that reducing class size helps in

improving learning and achievement (Nye, Hedges & Konstantopoulos, 2001). However, other scholars (Hattie, 2005; Lewit & Baker, 1997) argue that reduction of class size alone would not necessarily make much improvement. The fact that classes in sub-Saharan countries can approach one hundred learners (see table 5 in the appendices) of course has consequences on the quality of teaching. The quality and capability of the teachers can at least to some extent be enhanced through professional development programs, but too large classes remain the main restriction for qualitatively enhanced teaching (see also Hardman et al, 2001; Sumra, 2003).

Paying attention and listening to the learners' concerns to improve classroom management, and organisation and time are effectively used during the lessons i.e. assigning tasks, marking, giving feedback and support to low achieving learners. The findings revealed that much of the classroom time is used by the teacher. This is supported by a study of Hardman et al., (2012). In Tanzania, choral repetition takes up 62 percent of the class time, compared to 35 percent in terms of individual responses and also on disciplinary matters (Ehrenberg et al., 2001).

In view of the study findings, this can perhaps, be because of limited pedagogical knowledge of engaging learners. The motive for engagement is encouragement and praise. Limited engagement has been experienced by teachers affecting learners' motivation to learning.

7.1.2 Teachers' experiences of contextual constraints

The literature review suggests that if textbooks are available, they have a significant role to play in making learning meaningful (Hardman, et al., 2012) in the sense that teachers are able to focus on learners' cognitive engagement with the content that they are teaching. The most prominent experience teachers expressed to affect negatively their work was lack of or in adequate teaching materials to support individual learner learning, and the major focus is on textbooks.

The findings further showed teachers face difficulties in teaching due to lack of materials. The teachers' concern was with failure to engage

learners in practice, particularly in science subjects. The learners have developed a dependency habit and rely much on transmitted knowledge from teachers. In that way, innovations and creativity are hardly developed. The teachers cannot be visible to their learners in terms of developing their thinking capacity and emphasising problem solving (Hattie, 2009; see also Mayer, 2002).

The main material that teachers reported they depended on in teaching was the textbook, which for some reason is not adequate enough to support individual learner's learning. This is evident in the literature review (Hardman, et al., 2012; Uwazi newspaper, 2011; Uwezo, 2010), where the teachers described experiencing difficulties in teaching due to inadequate textbooks as a basic source of teaching materials. The respondents' dilemma was that they had to manage large classes in using only the few textbooks available as one respondent expresses: *'I have difficult in planning reading lessons due to inadequate textbook. The learners fail to share the few copies provided by the school, especially during reading lessons'.* The respondents were concerned with learners' low acquisition of basic literacy skills of reading and writing. The lack of textbooks meant that teachers failed to plan and conduct reading lessons properly and some learners may complete their seven years of primary education without acquiring the basic skills of reading and writing (Uwezo, 2010).

Lack of textbooks has created variations in performance among learners and the development of language for future learning. Other teachers associated the lack of textbooks with losing the benefits that learners could gain in doing exercises, assignments, homework, reading and practical work. The participating teachers emphasised the need to involve the learners in the preparation of teaching and learning materials from their environment. In such learning, teachers' power of feedback and monitoring, as Hattie (2005) pointed out cannot be visible to both the teachers and learners because teachers cannot provide information about the tasks that make a difference in learners' learning.

7.1.3 Teachers' experiences of professional constraints

What do teachers say about their professional constraints? Teachers' experiences indicate variations concerning subject matter knowledge, pedagogical knowledge and restricted planning. Subject matter knowledge has been discussed earlier in (4.1) as it implies knowing the subject content and making it understandable to learners (Cohen, Manion & Morrison, 2003). Inadequate knowledge of the subject is attached to the problem of teachers' omission of some topics that found difficult or not clear to them.

The notion of pedagogical knowledge as discussed and elaborated in Chapter 4 refers to the knowledge of various methods of presenting the subject content to the learners (Shulman, 1987). Teaching methods determine classroom social relations and practice. Because teachers lack knowledge and the skills of presenting the content, learners are not guided in their learning, but rather reduced to reproducing instead of constructing knowledge.

From this perspective, it seems clear that teachers are experiencing isolation at work because of detachment. They lack support and have been working in isolation and hiding their weaknesses and have failed to connect with their fellow teachers. Working in isolation has resulted in a lack of confidence in their work. These practices have created a tendency of fear of asking and seeking help from colleagues. In such situations, teachers tend to teach to meet the curriculum and not for the learners to understand and make use of the knowledge and skills learnt. Teachers encounter difficulties in bringing each learner into the learning process.

Planning is an essential part of teachers' work and depends also on other factors such as subject matter knowledge and choice of teaching methods that will guide the planning. The findings indicated major problems that teachers experience which are related to the connection of current learning and previous lessons.

7.2 Teachers' experiences of actions taken for improvement

The experiences of primary school teachers after attending EQUIP professional development courses were investigated and discussed in 6.2. As described earlier, these experiences were explored in relation to research question number two: *'How have teachers improved their classroom actions after undergoing professional development courses?* Three main categories were identified in respect to this question as revealed from respondents.

7.2.1 Teachers' experiences of increased classroom interaction

What were the teachers' reactions experienced after attending professional development courses? The experiences reveal increased improvement and enthusiasm in their teaching after attending pedagogical knowledge courses. Dorothea's (a respondent) reaction was: *'after attending courses in the EQUIP program, now I use a variety of methods in my classes'.* This has been supported in indicating how teachers have improved teaching in the program schools (Hamilton, et al., 2010; Kitta & Komba, 2012; see also Supovitz, Mayer & Kahle, 2000). Not only Dorothea experienced development with an ambition of getting learners involved; Makunda emphasised the promotion of learners' confidence and thinking abilities and says '….*after EQUIP, learners are enjoying learning',* but also the relationships of the increased interaction are reflected in changes in attitude towards meeting learners' learning needs, towards managing the classroom and enhancing encouragement and engagement.

Change in attitudes or behaviour towards meeting learners' learning needs might raise the question of whether teachers have changed their attitudes as a result of professional development courses attended. The results acknowledge that teachers have indeed changed their attitudes and behaviours towards meeting the learners' learning needs, as a result of professional development attended. The findings show changes in attitude in terms of supporting low achievers, assisting individual learners and giving feedback, seeking the prior knowledge of learners and creating

space for thinking in the learners, as expanding attitudes in their teaching actions. In addition, proper selection and making use of appropriate teaching methods that engage learners, such as group discussion, think pair and share, jigsaw, gallery walk, question and answers, among many others, were used as mechanisms for stimulating teaching and learning. Hattie (2009) argues that professional development is likely to change teachers' learning, but the learning is less effective in terms of teachers' actual behaviour. It was also revealed that in-service programs were effective in changing teacher achievements, skills, and attitudes.

One way of internalizing the change in attitudes is through understanding of pedagogical content knowledge (Schulman, 1986). The respondents indicated that they derived benefit from the courses they attended. Professional development courses enhanced the quality of their teaching and learning in the classroom. In contrast, proper selection of teaching methods creates an environment in which learners are part of the learning process. Learners were motivated, and their participation and involvement in learning, as well as an increased

Teachers are among the most influence in learning. The finding indicated that through improved pedagogy teachers have been organizing their classes in such a way that those learners who do not cope well with the lessons are attached to and assisted by their peers after lesson hours, during afternoons outside school hours. The teachers seem to be aware of the importance of individual learner support. Hatano and Inagaki (2000) assert that learners are likely to learn more when they interact with their peers than from their teachers.

As it has been argued, change in teachers' behaviour is not a guarantee to achieve management of the classroom. Teachers have been trying to deal with large classes to make learners benefit from learning. Despite the size of the class teacher can now assign tasks, mark and provide feedback and support the low achieving learners. The teachers' practices are supported by research. When teachers demonstrate the power of active feedback, of consciously monitoring learners' progress and of providing immediate feedback on tasks, a positive change will follow (Hattie, 2009).

Regardless of courses offered by EQUIP, teaching large classes with limited resources continues to negatively affect the class teaching time and management (Wilson, 2006). There have been concerns that learners in such classrooms may not be able learn fully to read and write (Uwezo 2010).

7.2.2 Teachers' experiences of expanded utilisation of the context

A context as described in Chapter 3 includes the space in which learning takes place, and the resources. The findings have focused more on the materials available within the environment both at school and home. The first aspect expresses *expanded and appropriate use of the environment*. The results show that teacher together with their learners collect material and improvising aids to support teaching as Hawa (respondent) asserts: '*In most cases I depend on the availability of raw materials in their environment, I organize learning groups and they prepare in group.*' Teachers are assisting learners in all stages as the focus is on collection, improvisation and use of the prepared teaching and learning materials to improve learning.

The importance of textbooks is emphasized in the literature (Hardman et al., 2012; REPOA, 2010; URT, 2011; Uwazi Newspaper, 2010) while the teachers in the study reported inadequate provision or lack of textbooks due to the prevailing shortage of funds from the local government. Teachers had anyway improved in paying more attention to their learners and become more aware of the need for textbooks and other teaching material as a prerequisite for improving their work. Furthermore, the awareness of recognising the individual learner's creativity and hidden aptitudes had been promoted. During the interviews the respondents pointed out that involving learners in the preparation of teaching and learning materials reduces the tendency to depend on funds from the government.

Appropriate use of teaching and learning materials is crucial for improving classroom actions. When teachers fail to meet the learners' needs and provide adequate and individual support to learners, they tend

to drop out of schooling (Patton 2008). As discussed in 6.1, the results revealed that teachers have not been utilising the environment as a resource to support their teaching. However, from the courses attended, teachers have expanded their teaching actions in utilising the environment.

7.2.3 Teachers' experiences of the expanded professional role

The teachers' professional development has greatly influenced their classroom work in terms of increased knowledge of the subject matter content. Before the EQUIP program teachers claimed to have little knowledge of the subject.

Shulman (1986) contends that mastery of subject content is crucial because it guides teaching, and in 6.1 the teachers described their inadequacy in all three forms of knowledge as a severe constraint. But after the EQUIP program, the teachers showed improved subject matter knowledge, pedagogical knowledge and pedagogical content knowledge. Improving particularly subject matter knowledge is crucial because learners will receive appropriate knowledge and skills for future life (Ball & Bass, 2000; Hill, Rowan & Ball, 2005). The findings revealed that mastery of subject knowledge generates a sense of self-confidence and the power of teaching among teachers. Teachers have been sharing experiences on better ways to improve their work as Mutwa (respondent) acknowledges: *'EQUIP has brought us together, now we can solve our teaching problems through discussion.'*

It should be obvious that improved pedagogical knowledge expresses how knowledgeable teachers are on various teaching methods and their appropriate use. The participating teachers acknowledged that professional development courses have improved teachers' classroom work and their ability to present the subject matter and be understood by learners (Shulman, 1986). Teachers need all possible subject matter knowledge, pedagogical knowledge and pedagogical content knowledge (Mayer, 2002), in order to adequately face the challenging task of acting

as a professional teacher in the context of large classes and lack of textbooks and other teaching material.

The results revealed improvement in unity and cooperation among teachers in areas like planning and working together, team teaching, lesson observation and reflection. Both teachers and learners have benefited from the EQUIP in-service courses (see also Kitta & Komba, 2012). However, the success in teaching depends on many factors, and not only on one aspect of knowledge discussed. Hegarty (2000) argues that if teachers are not competent in teaching methods, then no learning will take place in the classroom. Through EQUIP the respondents' practices have empowered learners and now teachers can team up, work together and share what they know with their colleagues (Hamilton et al., 2010; Sedere et al., 2008).

Adequate planning empowers teachers to teach with confidence. Increased understanding of learners resulted in a planning process characterised by focus on the learners' learning needs and on understanding of the content to be taught. As Klafki (1998) affirms, teacher planning has to incorporate learners' learning styles, teaching methods and assessment strategies. A big challenge experienced by the majority of teachers in planning was how to accommodate truants in coping with learning.

Reflection, as discussed in 4.2.4, is an important mechanism in improving teaching actions. In one way, reflection is a way for teachers to assess their progress or examine the ways they teach, i.e. a process of looking back (Schön, 1983), which means reflection on action. Varied experiences such as reflection as a monitoring and evaluating tool, requirements for improving teaching and learning, understanding learners' ability and enhancing self-assessment were expressed by the teachers have improved teaching. When further scruitinizing teachers' experiences, it is noticeable that some teachers were still frustrated because of the classroom environment. They failed to meet the individual needs and to manage the learners' learning. These teachers felt they were being blamed by society for children falling behind their expectations (see also Murray, 2011).

7.3 Methodological considerations

My study is a qualitative in nature, employing a phenomenological approach. A phenomenological study was design to explore the lived experiences of primary school teachers engaged in EQUIP professional development courses. The approach offers the potential for deep understanding of the selected group of teachers working under the same conditions as primary school teachers in public schools.

The two research questions posed for the study offer many possibilities for data collection. The research instruments for gathering data also provided different ways for reporting results. In order to gain an overview and receive a representative view of primary school teachers' experiences of constraints and actions taken for improvement, three instruments for data collection were chosen: *interviews (semi-structured)* in order to gain a deep understanding of phenomena studied; *videotaping,* i.e. capturing what was expressed beyond words and *observation*. In this way, obtaining richer and more detailed descriptions from the respondents was possible (Henning, Van Rensburg & Smith, 2004).

However, the design of the findings comprising three major themes was not primarily for comparison purposes or giving a complete view of teachers' constraints and action taken for improvement, but rather the ambition was digging deeper on teachers' experiences and lifting issues up under surface, looking from different perspectives.

The results were organized in three themes. The first and second part has been a general interpretation of the teachers' descriptions according to the research questions, based on constraints to teaching and actions taken to improve teaching. The third theme came from going deeper into the categories or patterns and looking from other perspectives at the teachers' experiences. I could identify two apparent types of phenomena that have a big impact on teachers' work and individual teacher character types, finally, the voices of two teachers were recorded (the teachers' narrated their experiences through story-telling).

Interviews: In order to improve the validity of the instruments, a checklist was made before the entire data gathering (see 5.5). The risk of unnecessary questions was limited and modified. A sample of 40 primary school teachers with different level of experience (Table 4) was purposively selected (Cohen, Manion & Morrison, 2007), and included urban and rural school contexts. The ambition in selecting the sample through purposive sampling was from the assumption that lived experiences can only be obtained from experienced respondent, thus there was the possibility of getting the most experienced teachers out of the population (Cohen et al., 2007).

Data were collected through semi-structured interviews, because of their flexibility, intensity and ability to obtain further clarification through follow-up (probe) questions (Thomas & Pollio, 2002). Some of the probing questions were such as: How do you manage to teach in such a class? Why do you put more emphasis on girls? What strategies do you use to help slow learners? Are they effective? What influences your teaching? What changes have you experienced in your teaching?

Although at the beginning of the interviews the interviewees were somehow nervous and found it difficult to describe their teaching experiences, nevertheless in the course of interviewing they were motivated and sustained their interest in explaining more about their experiences (Larzén, 2009). The reason behind feeling nervous was probably that they were not used to interviews and were t also possibly unsure about their new experiences and therefore reluctant to talk about them.

Consent for all interviews recorded was sought to obtain greater detail from the interviews. The interviews also provided a high level of detail, as one cannot remember everything or even take notes accurately (Rice & Ezzy, 2000). The location of the interview can threaten the validity, and to avoid the interviewees chose a convenient location for both the researcher and themselves.

Observation: Observation was a secondary data collection instrument. The same interviewed respondents were involved. Data collected from observation were interpreted to enrich the data gathered from the interviews. Through structured observation, my research assistant and I applied investigator triangulation (Creswell, 2008). We recorded and shared data gathered immediately after the lesson observation and agreed on important and relevant issues to include in the results. Observation involves watching and recording. One risk concerning validity in observation is that the respondents may not find it easy to accept the situation of being observed and still behave "normally". Sometimes they can change their behaviour drastically. To avoid such feelings and actions right from the beginning, we introduced the purpose and the procedures to be undertaken.

Videotaping was another way of looking at how the interviewees communicated their experiences (Henning, Van Reinsburg & Smith, 2004). Video was used for further capturing teacher actions in a class and teacher exciting moments: for instance, the actions during the lesson interactions in the classrooms. As with observation, this also enriched the data and validated the results. The videotaped respondents were not sufficiently represented, since only 10 percent voluntarily participated. This was a way for them to view their own actions and behaviour in relation to the experiences expressed during the interview (Lyle, 2003), a means of triangulation of their interview responses. The danger is that the respondents (teachers) can just teach for the sake of being recorded and being seen in the video, and act dramatically. In order to help the respondents to relax I pre-tested the camera and the recording for each teacher in the classroom to ensure the quality of the recording.

7.4 Implications of the results

The intention of exploring teachers' classroom constraints and their improved actions after professional development was to gain insights into and understanding of the sampled population of teachers working as primary school teachers in Tanzania.

The study foregrounds many positive and encouraging experiences from in-service primary school teachers after their participation in professional development programs. The results have shown that teachers' experiences were influenced by constraints experienced on the one hand, and on the other hand, experienced new knowledge and skills of teaching through professional development. Furthermore, the teachers pointed out several experiences of isolation, frustration, withdrawal, gender bias, innovation and reflection that seem to influence primary education in Tanzania due to lack of professional development activities.

Implications at policy level: The study points out the need for continuous and sustained programs for teacher development and how to manage large classes. As a long term solution this will need commitment in plans and priorities from the policy makers and the government, before reduction in the number of learners in a classroom can be met.

To meet the desired learner-teacher ratio of 40:1 is an issue that needs attention. Large classes were the most restricting factor expressed and experienced by all the participating teachers in this study and have negative effects on their work. MoEVT together with the policy makers can use the results to establish a national program for reducing class size for teachers to have manageable classes with a reasonable number of learners. In order to meet the learners' increasingly diverse needs, professional development programs for teachers have to be established in terms of lifelong learning, in all aspects of teacher development.

Implications for teacher education: Another issue is about providing adequate preparation for student teachers. The results therefore, are useful in addressing the preparation of learners at all levels, from pre-primary, and primary to secondary education and teacher education in order to encourage competent and knowledgeable students to join teacher education courses. The situation needs attention since teaching is a shared and collaborative responsibility for more than one institution, (pre-primary, primary, secondary education, teacher education and even higher education). There is a need for teacher education to strengthen student teachers' subject content knowledge, pedagogical knowledge and pedagogical content knowledge. Moreover, the results revealed that

teachers are ill-prepared and graduate with inadequate knowledge and skills in how to cope with classroom realities. Thus, teacher education requires systematic and well-formalized short and long-term teacher development programs for both experienced and newly employed teachers.

Implication for schools and district councils: Present opportunities for teacher development are irregular and uncoordinated. Professional development has be provided not only in teacher institutions (colleges and universities), but also in schools. Learning from the EQUIP school-based programs are appropriate as they provide chances for teachers to internalise their teaching environments and find solutions to challenges that they encounter (Hamilton et al., 2010).

Mentoring as a tool for professional support and reflection is not well-established in schools to support the development of teachers. Schools and district councils have no strategies for supporting teachers to grow in their profession, and therefore integrated mentoring in schools is needed as part of a long-term program to support teachers' professional development. The district councils as employers are key actors in providing well-functioning schools and classrooms and supporting in-service teacher development programs. Supporting on the job teachers will ultimately improve the learners' learning.

In summing up, this thesis addresses the experiences of teaching constraints and the professional development of primary school in-service teachers from the EQUIP program in Shinyanga, Tanzania. Despite the professional development provided, the problems of unqualified teachers in Tanzania remain a challenge (Hardman et al., 2012).

Not surprisingly, large classes appear across all parts of the results as the most critical factor that affects the teachers' work (see also Davidson, 2004), followed by inadequate teaching and learning materials. Experiences of frustration among teachers, due to limited opportunities for learners to practice, and meeting their learning needs, remain as huge problems in connection with weak subject matter knowledge, pedagogical knowledge and pedagogical content knowledge.

Despite the professional development courses attended, teachers find themselves with mixed experiences, finding their work both appealing and challenging. Some teachers experienced benefit in promoting their innovative skills and reflection skills, whilst others experienced the feeling of frustration because of class size and lack of teaching materials.

To conclude, reflecting back on the aim of my study, it focused on deepening the understanding of teachers' experiences of their work. My ambition was to contribute to improving primary school teaching and learning outcomes. Teachers within the teaching profession have apparently entered into the profession with high expectations of getting support in their daily work and for further professional development. The reality, however, has caused frustration and for some even withdrawal. Therefore, an in-service program like EQUIP represents one option for encouraging teachers to become engaged in professional development that re-vitalizes their work.

7.5 Recommendations for further research

The interest of this research has been primarily to deepen the understanding of teachers' experiences of teaching constraints and the actions taken for improvement after undergoing the EQUIP professional development programs. From the teachers' experiences the empirical results provide a platform for further investigation on teachers' classroom work, focusing not only on the experiences of limitation, but also on improved classroom practices through professional development.

Majority of respondents' experiences have shown development on teaching actions. In order to obtain the impact of teachers' improved actions in teaching after the EQUIP programs and other similar programs within the country; there is a need for further studies to employ case studies and action research through, which other education stakeholders can learn. Furthermore, questions concerning teamwork, cooperative learning and the sustainability of the best practices of EQUIP-program, form a basis for research on how effective the strategies are in improving the quality of teaching in Tanzania.

Moreover, there is a need for studies which dig deeper into the problem of class size, focusing on the possibilities and hindrances to teachers' work within the framing factors. Finally, the results further serve as a starting point for educational discourse concerning class size, limited instructional materials, and textbooks in particular.

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Appendices

Interview questions

The guiding questions posed in this study were two: the first one about constraints to teaching and the second on actions taken for improvement of their work.

The first guiding question posed in this study was:
1. What do teachers experience as constraints to their work?

The supporting questions were:
   I.   Describe your teaching. What approach did you use?
   II. Why have you taught the way you are describing?
   III. Actually, what do you do in the classroom taking into account teaching actions?
   IV. What kind of teaching approaches or techniques do you use frequently in teaching?
   V.   What constraints have you encountered related to teaching and managing classes? How do you manage them?
   VI. What kind of teaching materials do you use?

The second guiding question posed was*:*
2. How have (you) teachers improved their classroom actions after undergoing professional development courses?

The supporting questions were:
   I.   How have the knowledge and skills gained from the program helped to improve teaching?
   II. What changes are you experiencing in your teaching?
   III. What do you do differently as a result of the EQUIP professional development courses?
   IV. How has professional development courses attended helped in dealing with large classes?

Classroom observation (protocol) checklist is in English and Kiswahili

Teacher/*Mwalimu:* F (*Ke)* ………..M (*Me)* ………..
No. of years in teaching/*Miaka aliyofundisha*………
Lesson/*Somo*……………………………….............
Topic/*Mada*………………………………………
Time used/*Muda aliotumia*…………………………
No. of pupils in the class/*idadi ya wanafunzi darasani* ………
Observer's signature/*Saini ya mchunguzi*...............

Teaching to meet learners learning needs *Kufundisha kwa kukidhi mahitaji ya kujifunza ya mwanafunzi*	More emphasised *Anahimiza zaidi*	Partly emphasised *Anahimiza kidogo*	Did not emphasised *Hahimizi*	Comment *Maoni*
Starting class on time in an organized manner *Anaanza somo kwa wakati na kwa mpangilio mzuri*				
Using several visual aids during class *Anatumia zana mbalimbali za kufundishia*				
Connecting content to pupils prior knowledge *Anaunganisha maarifa ya awali ya wanafunzi na maudhui mapya*				
Relating content to future practical (real world) application *Anahusishua maudhui na hali halisi ya maisha*				
Trying to meet as many learners as possible when teaching *Anajitahidi kuwafikia*				

wanafunzi wengi wakati wa somo				
Possessing mastery of subject content *Anauwezo mkubwa wa somo*	**More emphasised** *Anahimiza zaidi*	**Partly emphasised** *Anahimiza kidogo*	**Did not emphasised** *Hahimizi*	**Comment** *Maoni*
Using a range of teaching interactive approaches in a single lesson *Anatumia mbinu mbalimbali zinazomshirikisha mwanafunzi katika somo lake*				
Using varieties of activities in the class *Anawapa wanafunzi kazi mbalimbali zakufanya wakati wa somo*				
Checking pupils' understanding frequently *Mara kwa mara anapima uelewa wa wanafunzi*				
Encouraging pupils participation, ask and answer questions *Anahimiza ushiriki wa wanafunzi katika somo, kujibu na kuuliza maswali*				
Giving pupils enough time to finish tasks provided *Anatoa muda wa kutosha ili wanafunzi wakamilishe kazi zao*				
Guiding pupils to learn *Anawaongoza wanafunzi kujifunza*	**More emphasised** *Anahimiza zaidi*	**Partly emphasised** *Anahimiza kidogo*	**Did not emphasised** *Hahimizi*	**Comment** *Maoni*
Providing opportunity for learners to				

demonstrate, ask questions and feedback *Anatoa nafasi kwa wanafunzi kujaribisha, kuuliza maswali na kutoa mrejesho*				
Praising learners' efforts made (motivating) *Anawapongeza wale wanaojitahidi katika somo*				
Assisting the low performing learners *Anawasaidia wale wenye uelewa mdogo wa somo*				
Responding to pupils by names *Anawaita wanafunzi kwa majina*				
Monitoring and Assessing pupils' learning ***Anafuatilia na kutathmini kujifunza kwa wanafunzi***	**More emphasised** *Anahimiza zaidi*	**Partly emphasised** *Anahimiza kidogo*	**Did not emphasised** *Hahimizi*	**Comment** *Maoni*
Providing opportunity for learners to apply content *Anatoa fursa kwa wanafunzi kutumia maarifa yanayojifunza*				
Asking questions to individual to check understanding before moving to next issue or step *Anauliza maswali kwa mwanafunzi mmoja mmoja kupima uelewa wao kabla ya kuanza kipengele kipya*				
Monitoring learning assisting learners when				

have problems *Anafuatilia ujifunzaji na* *kuwasaidia wenye* *matatizo?*				

N.B: In italic are Kiswahili phrases

Informed Consent Form

Title: Professional development of teachers

This information is provided to help you to decide whether you wish to participate in the coming research project or not. This is to let you know that you are free to decide to participate or not, or even withdraw at any time without affecting your relationship with me or other researchers participating in this project. I will respect your withdrawal.

The purpose of carrying out this study is to explore teachers' experiences of constraints they encounter in teaching and the actions for improvement taken because of the EQUIP project. Data will be collected using interview, class observations and videotaping.

Please do not hesitate to ask any questions before participating in this research project. I will be open and happy to share with you the results of the research after completion. I will not mention or associate your name or any other aspect of identity that will allow people to recognise you from the research findings in any way. Only the researcher will know you through the identity that will be used.

There are no known risks associated with this study. The expected benefit from your participation in the study will be the providing of information about the challenges teachers face in teaching and the actions taken for teaching improvement influenced by the EQUIP project. If the study is submitted for publication, it will indicate the participation of all the teachers.

Please sign this consent form. I understand you are signing it with full knowledge of the nature and purpose of the procedures as discussed. I will give a copy of this form to you for your reference.
Name: Mary Soko
Signature..
Date: 20.07.2008..
Researcher,
P. O. Box 1971, Morogoro
Participant's
Name......................................Signature..............................Date............

Table 5. Learner to teacher ratio (PTR) from selected primary schools in Kishapu district

S/N	(Given) Name of school	# of learners per school	# of teachers per school	Teacher/ pupil ratio
1	Mwangaza	1278	14	1:91
2	Pasi	1013	12	1:84
3	Sangala	1026	18	1:54
4	Dalada	916	10	1:92
5	Nyenze	836	9	1:93
6	Bakulii	832	16	1:52
7	Baya	749	8	1: 94
8	Nyandindi	734	7	1:105
9	Ng'wendu 'A'	734	7	1:105
10	Ng'wamala	509	5	1:102
11	Ng'wingila	529	5	1:106

Mary Vincent Soko

Professional Development

The experiences of primary school teachers in Tanzania

How many learners in a class are said to be many? How might a Tanzanian class with eighty learners affect the possibilities for good teaching and learning? How are teachers in crowded classrooms coping with a lack of teaching material, particularly textbooks?

The study focuses on these kinds of questions by investigating Tanzania primary school teachers' experiences of prevailing teaching constraints and actions taken for improving classroom work.

The results indicate a wide range of constraints and restrictions that hamper quality teaching. The results also reveal that firm actions for professional development can contribute to concrete improvements regardless of overfull classes and scarce teaching material. Through a long lasting in-service program, teachers were trained to handle the prevailing conditions; for instance, to pay more attention to the individual learner, to increase cooperation with colleagues and to utilize the environment as a teaching resource.

Mary Vincent Soko | Professional Development | 2014