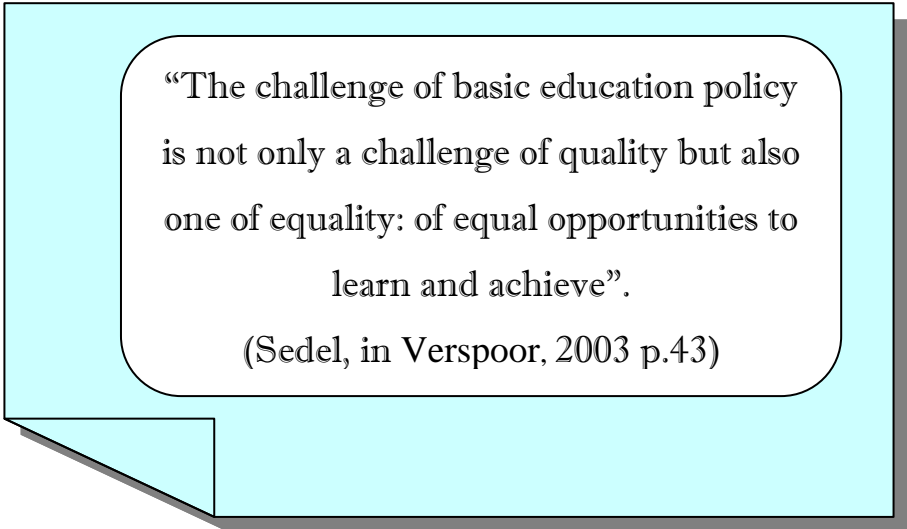


CHAPTER 1

INTRODUCTION



“The challenge of basic education policy is not only a challenge of quality but also one of equality: of equal opportunities to learn and achieve”.

(Sedel, in Verspoor, 2003 p.43)

The aim of this study is to investigate the effect of teacher competence on pupil performance in upper primary schools in Mozambique and other SACMEQ countries. UNESCO, the United Nations Educational, Scientific and Cultural Organisation, in accord with The Universal Declaration of Human Rights, believes that there should be “full and equal opportunities for education for all.” Working towards this aim over the past 60 years has led to the development of the Education for All (EFA) movement, which aims to give everyone the chance to learn and benefit from basic education – not as an accident of circumstance, nor as a privilege, but as a right. This movement’s goals are to expand early childhood care and education, provide free and compulsory primary education for all, promote learning and life skills for young people and adults, increase adult literacy by 50 percent, achieve gender parity by 2005 and gender equality by 2015, and finally, to improve the quality of education.

African countries racked by the legacy of colonial rule, their fight for independence and their outdated colonial systems of education have over the recent past worked hard at putting UNESCO’s mandate and particularly EFA’s goals into practice by becoming partners in working

toward these ends. Mozambique, and other SACMEQ¹ countries, are signatories to this framework document and have committed themselves to improving access to and the quality of education.

However, there is growing concern about the standard of education in Mozambique and other SACMEQ countries, as they continue to grapple with the task of implementing new systems while maintaining their standards. The aim of the various ministries of education is to ensure that all the children for whom they are responsible have access to schooling, but also in accordance with EFA's goals to ensure that the education provided to them is seen to be worthwhile and of sufficient quality. Quality education depends, crucially, on the teaching and learning process, as well as on the relevance of the curriculum, the availability of materials and the conditions of the learning environment (UNESCO, 2008).

This thesis provides comprehensive information about and understanding of the relationship between teacher competence and pupil performance in upper primary education in Mozambique and other SACMEQ countries. The first chapter begins with this introduction, followed by an overview of the context of the study in Section 1.1, which leads into a statement of the problem in Section 1.2, while Section 1.3 presents a motivation for the study. The significance of the study is described in Section 1.4, the research approach and design are presented in Section 1.5, which is followed by a statement of the limitations of the study in Section 1.6, and finally Section 1.7 presents the structure of the thesis.

1.1 THE CONTEXT OF THE STUDY

The Republic of Mozambique is located in the southeastern part of Africa and is divided into eleven provinces, namely Cabo Delgado, Niassa, Nampula, Tete, Zambézia, Manica, Sofala, Inhambane, Gaza, Maputo Província and Maputo Cidade (the capital of the country). According to the 2007 census (Instituto Nacional de Estatística - INE, 2008), Mozambique has an overall population of 20 530 714 inhabitants with 52.3% of the overall population being female. The gross illiteracy rate is 34.3%, with the overall illiteracy rate amongst the female population being 66.7% (INE, 2008).

Mozambique was a Portuguese colony from the fifteenth century until political independence from Portuguese rule was attained in 1975. It is a multilingual country with eighteen main Bantu languages (Siteo and Ngunga, 2000) and Portuguese is the official language and language of instruction from Grade 1.

¹ The SACMEQ countries are Botswana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, the Seychelles, South Africa, Swaziland, Tanzania, Uganda, Zambia, Zanzibar and Zimbabwe.

The National System of Education (SNE) was introduced in 1983. The three main objectives of the education system proposed by the Strategic Plan for Education (1998) were to increase access and educational opportunities at all levels of the education system for all Mozambicans, to maintain and improve the quality of education, and to develop an institutional and financial framework that would sustain Mozambican schools and pupils in future.

This background then outlines the context of this study where, for the first time, national and regional samples are used to analyse the relationship between teacher competence and pupil performance in Mozambique and in SACMEQ countries.

1.2 STATEMENT OF THE PROBLEM

The quality of education is a central theme in education systems. The quality of education is increasingly judged by focusing on pupil performance, what pupils actually learn, and how well they learn it. A number of studies have been conducted with the purpose of understanding how quality in education is achieved. Grauwe and Varghese (2000) focus on the textbook as the key factor for improving quality in education rather than on teacher competence, but in some of the literature teacher competence is singled out as the key factor (Westera, 2001, Medley and Shannon, 1994, and Shulman, 1986). This study will highlight the importance of the relationship between teacher competence and pupil performance particularly in a situation where resources are very limited and where many factors contribute to the inadequate performance of pupils.

To achieve a high quality of education in the era of *Education for All* is not an easy task. In order to give access to education to the whole population the state needs to build and develop many schools, to supply a large numbers of teachers, and to provide the related educational resources; and as Kanu (1996, p.180) asserts “apart from the quantitative dimension, the qualitative dimension is also staggering in its proportion.” A very high proportion of teachers at primary and secondary school level have no professional teaching qualifications, many of them not being educated beyond secondary school level. Conducting a study in Pakistan, Kanu found that there was no observable difference in quality between trained and untrained primary teachers and, given the very low salaries paid to teachers, there tended to be no immediate desire among unqualified teachers to improve themselves academically or professionally.

This fact is confirmed by Boehme, Chiau, Matevele and Otto (1991) when they show that in some Maputo schools there is no significant difference between trained and untrained teachers in terms of student achievement, when taking into account the very low level of teacher training. However, some differences in the repetition rate in terms of teacher experience can be noted. This situation is

explained by Dzvimbo and Lima (1994, p.33) when they argue that in Mozambique primary schools, teacher trainers lack experience of teaching in primary schools and that consequently there is an over-emphasis on content knowledge in teacher training courses instead of a balanced curriculum which incorporates both content knowledge and pedagogy. This imbalance could be the reason for teachers following the methodology in the teachers' guide without any change or adaptation, as they have little pedagogical or methodological foundation on which to draw.

A study conducted by Miguel and Barsaga (1997, p.120) considered factors affecting pupil performance, investigating the variables of teacher, student, parents and community, and concluded that the teacher was the key factor in student achievement. The quality of education depends on the quality of teachers, particularly in the initial stages of education when the pupils are at an early age, and especially in the rural areas (Châu, 1996, p.116). If that is so, then the quality of primary school teachers, both academic and professional, cannot be overly emphasised. Training plays an important role in improving the quality of education in schools. The professional quality of the trained teacher depends on the quality of the curriculum to which the teacher was exposed and the ways in which it is implemented.

In Mozambique, the teachers in the upper primary or second grade (EP2) generally have little academic and professional training, as is indicated in the SACMEQ II study (2003). A similar situation prevails in Pakistan, as documented by Kanu (1996). Kanu notes that in these circumstances teachers have serious limitations in actively participating in the successful implementation of new curricula or methods (p.180).

For these reasons, realising the importance of teacher quality in improving the quality of education, countries like Taiwan have prioritised teacher education in their educational reform (Fwu and Wang, 2002). In considering what constitutes teacher quality Fwu and Wang (2002) state that teacher training should develop content knowledge, pedagogical skills, the ability to reflect and to empathise, managerial competency, commitment, moral conduct, the ability to adjust and improvise, the capacity to collaborate with other teachers, the ability to advance the profession of teaching, and to contribute to society at large. In addition, they suggest that the quality of a teacher should ultimately be evaluated in terms of his/her impact on the quality of his/her students.

Pearlman and Tannenbaum (2000) also discuss the issue of evaluation of teacher quality, and they suggest that the evaluation system must take into account teacher education, teacher performance and student achievement. Dimmock (1990) identifies the three major elements that need to be evaluated in assessing the quality of the provision of education: the teacher/educator, the

student/learner, and the curriculum and he stresses that curriculum change can enhance quality in education. He defines “quality in education” as involving one or more of the following elements:

- ❖ Improving the standards of teaching and teachers’ performances;
- ❖ Improving the standards of learning and learners’ performances; and
- ❖ Providing a curriculum more relevant to client needs (Dimmock, 1990, p.201).

Presently, the aim of the Ministry of Education and Culture (MEC) in Mozambique is to improve all three aspects: the teachers’ performance, the learners’ performance, and the curriculum. It is hoped that improving the quality of all three of elements will simultaneously improve the quality of education.

Research has shown that the nature of teacher training in Mozambique, with its many models and its poor training, has resulted in a dearth of competent teachers, particularly in reading and mathematics, and that this dearth has had negative consequences on the quality of education (Boehme, Chiau, Matevele and Otto, 1991, Dzvimbo and Lima, 1994, and Passos, Navesse and Chiau, 2000). “Teachers at all levels are often under qualified for the posts they hold” (MINED, 1998). The MEC thus recognises that the quality of education and teacher training provided in institutions go hand in hand. The quality of education is normally measured by pupil performance in their tests, and pupil performance is related to teacher competence and teacher performance in the classroom.

The purpose of this study is to investigate the effect of teacher competence on pupil performance in upper primary schools in Mozambique and other SACMEQ countries, drawing on data collected for the SACMEQ II study. Three main questions direct this investigation:

- 1. What is the relationship between teacher competence and pupil performance in reading and mathematics in upper primary schools in Mozambique?*
- 2. How does the relationship between teacher competence and pupil performance in mathematics and reading compare across the different Southern Africa Consortium for Monitoring Educational Quality (SACMEQ) countries?*
- 3. What are the main predictors of pupil performance in reading and mathematics in Mozambique and in other SACMEQ countries?*

The objectives are to:

- ❖ Give information about teacher competence and pupil performance in upper primary schools in Mozambique;
- ❖ Give information about teacher competence and pupil performance in upper primary schools in SACMEQ countries;
- ❖ Identify the main predictors of pupil performance in reading and mathematics in Mozambique and in other SACMEQ countries;
- ❖ Make a contribution to the intellectual debate on competence, performance and the relationship between teacher competence and pupil performance.

1.3 MOTIVATION FOR THE STUDY

The MEC recognises that the quality of education and teacher training provided in institutions is often poor. “Teachers at all levels are often under qualified for the posts they hold. Nearly a quarter of all teachers in EP1 are entirely untrained, and the majority have received only six years of schooling and one year of professional training” (1998, p.9). For these reasons, the MEC has defined expanding access to education, improving educational quality and sustaining expansion and improvement as priority activities particularly where teacher training is part of the programme. Teacher training has been considered a burning issue for the last 30 years, but no clearly developed policy for teacher training has been developed to date (see Chapter 2, Table 2.4).

Many factors are involved in pupil performance and teacher competence, such as the pupils’ background, the condition of the school, the parents’ education, and the availability of textbooks to support the learning. However, the most important variable, as shown by some researchers, is the quality of teacher training. For many years improving the quality of education has been an important issue for the Ministry of Education (MINED) in Mozambique, especially in Primary Education (Grades 1 to 7), and improving the quality of education remains one of the aims of the MINED strategic plan. Despite these efforts some problems have remained, such as poorly trained teachers, the limited availability of materials, and a weak budget framework that does not comprehensively cover the needs of education in the country. The high incidence of repetition and dropout indicates the low achievement in primary schools, as identified by Reimers (1997). Improving the quality of basic education seems to be at the forefront of the national education agenda, as evidenced by several actions that have already taken place, such as the transformation of the curriculum for basic education, a new teacher training strategy, improving access, and capacity building (MINED, 1998).

The Ministry of Education and Culture has carried out many studies in the area of teacher training institutions and performance in lower primary schools. Unfortunately, it does not have the same information about upper primary schools (EP2). The Ministry has introduced new curricula for upper primary teacher training without assessing the old ones, which means that policy is being implemented without an accurate and appropriate information base. This fact confirms the existence of what Reimers (1997) referred to as a significant problem: the practice of making education policy decisions without sufficient information on which to base the decisions – particularly in the area of teacher training.

1.4 SIGNIFICANCE OF THE STUDY

This dissertation should be particularly significant, as it is the first cross-national study conducted in Africa using SACMEQ data (2000) in a secondary analysis. UNESCO have standardised the data and thus comparisons can be made between teacher competence and pupil performance, with special reference to competence in reading and mathematics across a variety of contexts and systems in SACMEQ countries.

As previously stated, many studies have been conducted in lower primary education (EP1) but not in upper primary schools (EP2). A contribution that this study might make is therefore the provision of useful practical information on upper primary education for the MEC, while contributing to the intellectual debate and the literature on the relationship between teacher competence and pupil performance. The study investigates teacher competence and its effects on pupil performance in a very specific setting taking into consideration the reality in Mozambique, including the contextual constraints and the stage of development. The study also examines teacher competence and pupil performance across SACMEQ countries, which have diverse histories, cultures, and education and economic systems.

A further contribution of this study is the attempt to assist curriculum development specialists and national policy makers who design teacher-training policy for upper primary schools. The study provides a model of competency which could be used as a basis for the development of teacher-training policy and the design and implementation of a teacher-training curriculum. The study also provides an integrated approach model for developing teacher competence in teacher training institutions. It is hoped that the development of this model will also be a contribution to the literature on how to develop teacher competency in teacher training institutions.

1.5 RESEARCH APPROACH AND DESIGN

This study adopts a quantitative approach which “is one in which the investigator primarily uses post-positivist claims for developing knowledge (i.e., cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the testing of theories), employs strategies of inquiry such as experiments and surveys, and collects data on predetermined instruments that yield statistical data” (Creswell, 2003, p.18). This quantitative research approach was implemented by collecting data using predetermined instruments and tests that yielded statistical data for the SACMEQ study of 2000. The instruments included closed-ended questionnaires for teachers, pupils and school heads as well as tests in reading and mathematics for teachers and their Grade 6 pupils.

The data was analysed using the Statistical Package for the Social Sciences (SPSS) software package. A Multivariate Regression Model (MRM) was applied to analyse the variation of pupil performance explained by all of the predictors. The study identifies the main predictor for pupil achievement. With these results, it was possible to understand to what extent the data and the relationships are explained by the conceptual framework. The descriptive statistics (described in Chapters 6, 7 and 8) include a correlation matrix (reported in Chapter 9) to provide initial relationships for further analysis of the effect of teacher competence on pupil performance.

The data was analysed in two parts: the first part involves univariate descriptive analysis and the second part involves bivariate correlations and partial correlations analysis such as correlations between pupil performance and teacher profile and schools conditions. Multiple regression analysis was undertaken of the teacher profile (teacher knowledge, professional training, academic level and teacher experience), and school conditions as factors influencing teacher performance (including pupil achievement scores on SACMEQ tests as a proxy of teachers’ performance) at provincial, national and regional level.

In summary, the data analysis was performed in three stages. In the first stage, the data was weighed and aggregated by school, and then PCA was used to develop proxy variables for the domains in which there are no indexes on the database. In the second stage, the analysis began with basic statistics (correlations) related to pupil performance and their background. Finally, the regression model was developed in the third stage, using the multivariate regression equation to determine to what extent the empirical evidence supports the conceptual framework. Findings are presented in all three of the stages with the Mozambican results being followed by comparisons between Mozambique and other SACMEQ countries.

1.6 THE LIMITATIONS OF THE STUDY

One of the limitations in this secondary study is the fact that data collected in 2000 was used for analysis in 2007. Many features could have changed in the four years. Another limitation is related to the SACMEQ countries, where different countries have different systems. Mozambique in particular has a very different history, system of education and official language. (Portuguese is a language of instruction from Grade 1.) This language makes it impossible to compare the performance of pupils from different countries in the region.

According to the literature review, the best ways of measuring teacher competence are classroom observation and knowledge testing. But, because this thesis is a secondary study, it was not possible to observe classes.

1.7 STRUCTURE OF THE THESIS

This section gives an outline of the study, describing the aim and contents of each of the ten chapters of this thesis. The aim of **Chapter 2** is to provide background information about Mozambique and its educational system, which will contextualise the data analyses and interpretation of data presented later in the thesis. Firstly, information about the general characteristics of the country is provided, including its political history, geographical features, administrative divisions and population characteristics. Secondly, a general overview of Mozambique's education system, itemised as its historical development, its key features and the challenges it faces, as well as its teacher training policies and practices, is given.

The general information that is presented in Section 3.1 of **Chapter 3** is a reflection of the state of the art in the understanding of teacher competence. In Sections 3.2 and 3.3 the notion of competence in the field of teacher training is presented and discussed which is followed by a consideration of competence as part of teacher effectiveness in Section 3.4. Section 3.5 deals with the assessment of teacher competence, Section 3.6 explains the relationship between teacher competence and pupils' performance, Section 3.7 present pupil performance in cross-national studies in reading and mathematics, and the chapter is summarised in Section 3.8.

The purpose of **Chapter 4** is to give an overview of cross-national studies such as Progress in International Reading Literacy Study (PIRLS), Programme for International Student Assessment (PISA) and Third International Mathematics and Science Study (TIMSS), and to describe the impact and the main characteristics of the SACMEQ study in Mozambique. The chapter goes on to describe the crucial design and methodological issues involved in the implementation of the

SAQMEC study, namely, the planning of the study, instruments construction, sampling, data collection, data entry and data cleaning.

Chapter 5 describes the purpose of this study, which is to investigate the effect of teacher competence on pupil performance in upper primary schools in Mozambique and other SACMEQ countries. Three main questions direct this query. Each of the questions is derived from and related to the variables in the conceptual framework (see Appendices 3 and 54) illustrated in Figure 5.1. To answer Research Question 1 would entail providing information related to the quality of education in Mozambique in terms of teacher competence and its relationship to pupil performance, where the overall results are described by province and then nationwide. The results pertaining to Research Question 2 are described by country and region, and consideration of Research Question 3 provides information about the main factors influencing education quality in Mozambique and other SACMEQ countries in terms of teacher competence and its relationship to pupil performance.

In order to facilitate the development of policy at the Ministry of Education and Culture, the results are presented for reading and mathematics respectively, for the Mozambican provinces firstly and then for Mozambique, at the national level, compared with other SACMEQ countries.

The general information presented in **Chapter 6** covers the Mozambican and regional teacher characteristics (specifically age, gender, academic level, professional training and socio-economic status) and teacher job satisfaction, which are described in Section 6.1. The pupils' background and the problems they encounter in Mozambique and in other SACMEQ countries are presented in Section 6.2. The summary is presented in Section 6.3.

Chapter 7: the Mozambican and the regional internal teaching context (the availability of sitting/writing places, a teacher's table, a teacher's chair, bookshelves and classroom equipment such as a chalkboard, a dictionary, maps, a book corner, and teacher guides) is presented in Sections 7.1 and 7.2. The Mozambican and the SACMEQ external teaching contexts (in terms of education resources, the condition of buildings, the number of classes and pupils, and the nature of tuition and leadership) are presented in Sections 7.3 and 7.4. Finally, the summary is presented in Section 7.5.

The aim of **Chapter 8** is to describe teacher and pupil performance in reading and mathematics tests in Grade 6 in primary schools in Mozambique and in the other SACMEQ countries. The performance of both the teachers and the pupils was analysed per province as well as nationally for Mozambique, and then on a regional level, incorporating all SACMEQ countries. Performance was

also analysed by gender, socio-economic status and school location (urban and rural). The results presented in this chapter are based partly on the Mozambican report (Passos, Nahara, Magaia and Lauchande, 2005) and partly on further analysis conducted on the data from the SACMEQ database archive (2004). Summaries are presented as a preliminary step in the background information for further analysis in Chapter 9.

The purpose of **Chapter 9** is to provide information about the main factors which explain the pupil performance variation in Mozambique and other SACMEQ countries, and their relationship to teacher competence. Multivariate Regression Model (MRM) was used to analyse to what extent the pupil performance variation is explained by various domains described in the conceptual framework, as described in detail in Chapter 5, Section 5.3. The results are presented, starting with exploratory statistics such as bivariate correlations between pupil performance and each domain and construct within the conceptual framework, as was elaborated in Chapter 5 (see Figure 5.1).

Chapter 10 presents and discusses the findings of the study. Section 10.1 gives an overview of the context of the study, which is followed by a summary of the research questions and results, while methodological, substantive and scientific reflections on the study are presented in Section 10.2. Conclusions and recommendations relating to the main factors influencing pupil performance in Mozambique and in other SACMEQ countries in upper primary schools are presented in Section 10.3, and the study concludes with recommendations for further research in Section 10.4.

CHAPTER 2

THE SCHOOLING SYSTEM IN MOZAMBIQUE

INTRODUCTION

The aim of this chapter is to provide background information about Mozambique and its educational system, which will contextualise the data analyses and interpretation of data presented later in the thesis. Firstly, information is provided about the general characteristics of the country, including its political history, its geographical features, its administrative divisions, and the characteristics of its population. Secondly, a general overview of Mozambique's education system, describing its historical development, its key features and the challenges it faces, as well as its teacher training policies and practices, is given.

2.1 THE MOZAMBIKAN CONTEXT²

The Republic of Mozambique is located in the southeastern part of Africa and covers a geographical area of 799 380 square kilometres. The country is divided into eleven provinces, namely Cabo Delgado, Niassa, Nampula, Tete, Zambézia, Manica, Sofala, Inhambane, Gaza, Maputo Province and Maputo Cidade. These provinces are shown in Figure 2.1.

² The information included in this chapter is extrapolated from the Mozambican SACMEQ report (Passos, Nahara, Magaia and Lauchande, 2005, pp.1-9).



Source: Passos, Nahara, Magaia and Lauchande, 2005, p.2

Figure 2.1 Provinces of Mozambique

According to the 2007 census (INE, 2008), Mozambique has an overall population of 20 530 714 inhabitants. It is a predominantly rural country, with about 68.2% of the Mozambican population living in many small settlements located in areas that are difficult to access owing to the poor transport and communication network (INE, 2008). The 2007 census (INE, 2008) reports that 52.3% of the overall population are female. The population density is approximately 26 inhabitants per square kilometre with the capital, Maputo Cidade, comprising 5.4% of the total population of Mozambique.

Mozambique is a multilingual country with 18 main Bantu languages (Siteo and Ngunga, 2000) and many dialects. The official language is Portuguese but only about 30% of the population, who are mainly resident in urban areas, speak it. This language issue has had an impact on education, as Portuguese was the only language of instruction in schools until 2004. In 2004, the Ministry of Education and Culture (MEC) introduced the mother tongue as the medium of instruction, but initially this mother tongue instruction was introduced only in Grades 1 and 2 in some schools located in linguistically homogeneous zones. Apart from the language diversity of the country another factor to take into account is the gross illiteracy rate of 34.3% with the overall illiteracy rate amongst the female population being 66.7% (INE, 2006).

The country was a Portuguese colony from the fifteenth century until political independence from Portuguese rule was attained in 1975 after 10 years of bitter-armed struggle between FRELIMO and the Portuguese regime. Peace was interrupted once again during the early 1980s when the country experienced a civil war, which caused the loss of many lives and left a trail of destruction in its wake. After peace was again achieved in 1992, the infrastructure, ruined as a result of the trail of destruction left in the wake of the civil war, had to be rebuilt. The country has since undergone rapid socio-economic development.

In view of its political history and the impact that this situation has had on its people, it is crucial to outline the differences between the two different historical periods that Mozambique has experienced after independence. The first period, from 1975-1992, was characterized by a one party state, a socialist system of government and a centralised economy. This period was also marked by the occurrence of a bitter civil war. The second period, from October 1992 up until the present, is characterized in contrast by an open market (in a capitalist system) and a multiparty society.

The various school systems in the country, the teacher education system, and reforms introduced from time to time have been influenced by the Mozambican political system, particularly the socialist political system, a fact which is clearly illustrated in the policy of the National System of Education (SNE) introduced in 1983. Prior to 1983, of course, Mozambique's education system was made up of a number of different types of schools.

2.2 MOZAMBIQUE'S SCHOOL SYSTEM AND REFORMS

Before independence in 1975, Mozambique's education system consisted of missionary schools, public schools and private schools. The missionary schools catered for so-called "natives" (indigenous Mozambicans), and these schools were situated mainly in rural areas. The Government schools, which were located in predominantly urban areas, catered for Portuguese pupils and the "assimilados"³ until 1962, when this limitation was cancelled and any pupils could attend the Government schools. The private schools, most of which were owned by the church, catered mainly for wealthy people.

³ The "Assimilado" status was officially introduced in the governing system in 1917 through the Decree Law no. 317 and for the natives of the colonies to become full citizens (of their countries) they had to become Portuguese or manage to better assimilate the Portuguese language, culture and habits, thus becoming "Assimilados." To qualify as an "Assimilado" one had to meet such criteria as speaking Portuguese correctly, being able to read and write, to have a job and to evince "good" behaviour (in Sambo, 1999). The Portuguese considered their colonies as an integral part of Portugal. The "Assimilados" had full citizenship and the same status as the Portuguese in Portugal, and they could attend the same educational institutions, from primary school up to University (in Almeida, 1973).

All three different types of schools followed the same curriculum and sat the same examination, and the qualification certificates or diplomas had the same value. Pupils attending all three types of schools had to write examinations in the Government schools, and only the Government schools were allowed to issue certificates or diplomas. One of the characteristics of the pre-independence education system was that it was very selective in that only the pupils who successfully passed each grade were allowed to progress through the system, and pupils who were unsuccessful had to repeat the grade. This system has been retained in the post-independence education dispensation.

The National System of Education (SNE) was introduced in 1983 as part of the post-independence education system. It was the first system to be designed by Mozambicans themselves after the achievement of independence. The policy documents stated that the main goals of the education system were the eradication of illiteracy, the introduction of universal schooling, and the education of citizens for socio-economic, scientific, technical and cultural development needs (SNE, 1985, p.4).

The SNE document states that all citizens have a right to education, as education reinforces the leading role of the working class, and the alliance between the working class and the peasants, which is the main instrument for the creation of the new man, is based on national experiences and on Marxist and Leninist principles. It is to be managed, planned and controlled by the State, which is secular in character (1985, p.5 – Article 1).

With reference to teacher training, the Ministry of Education characterized the “new teacher” as a person who has a pedagogical and methodological qualification as well as scientific and technical qualifications aligned to the new values of the socialist system in place at that time. The goals for teacher training as defined by the MEC were to:

1. Ensure the integrated education of teachers, arming them with the scientific ideology of the proletariat, and thus enabling them to educate the youth and adults.
2. Instil in the teacher the profound patriotic and revolutionary conscience based on the revolutionary principles of the FRELIMO Party.
3. Consolidate the scientific and materialist view in the teacher.
4. Provide the teacher with pedagogic training based on a socialist pedagogy and adjusted to the demands of the Mozambican revolutionary process.
5. Allow the teacher to constantly elevate his level of political, ideological, scientific, technical and pedagogical training (SNE, 1985, p.5 – Article 1).

The SNE comprises five subsystems, namely General Education, Adult Education, Technical/Vocational Education, Teacher Training, and Higher Education (see Figure 2.2 for more details). The general education subsystem is organised into three levels which will be discussed in the next subsection. Pre-primary education, however, does not feature within these subsystems.⁴

⁴ Pre-school education is provided in the crèches and kindergartens, usually under the administration of the Ministry of Health or private institutions. This education is not compulsory and is beyond the financial means of the majority of Mozambican citizens. As a result, only a small percentage of the target age group participates in formal pre-school education.

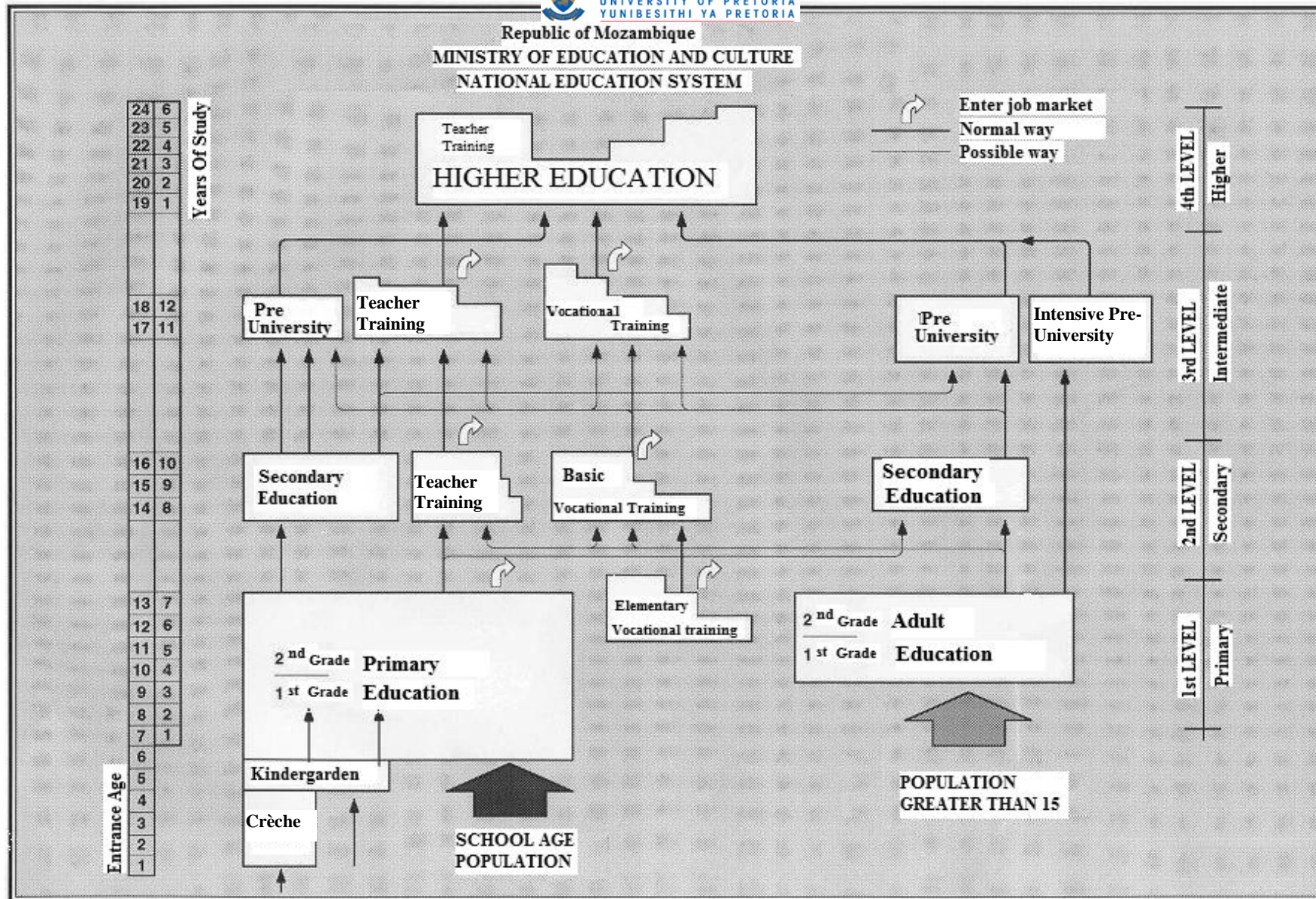


Figure 2.2 The Mozambican school system

2.2.1 General Education

General education is the backbone of the SNE, and is divided into three levels: primary, secondary and higher education.

Level 1 - General primary education

Primary education is free and compulsory in Mozambique for pupils from the official entry age of six years. It is subdivided into two levels, that is, lower primary education (EP1), which consists of five years of schooling (Grades 1 to 5), and upper primary education (EP2), which consists of two years (Grades 6 and 7). Usually primary schools operate in two time shifts, but due to the shortage of school places at this level, some primary schools need to operate using three shifts. After seven years of primary education, the pupils have a choice of enrolling for general secondary education, lower primary teacher training (to teach from Grade 1 to 5), basic technical and vocational education, or secondary education for adults.

Level 2 - General secondary education for adults

General secondary education is divided into two stages. The first stage, junior secondary, consists of three years (Grades 8 to 10). The second stage, senior secondary (also known as pre-university), comprises two years (Grades 11 and 12). Both levels of education are offered on the same premises. After three years of junior education, the pupils have a choice of enrolling for senior secondary education, middle primary teacher training (to teach from Grade 1 to 7), and the intermediate level of technical and vocational education.

Level 3 - Higher education

Public and private universities, higher institutes, schools of higher education and academies provide higher education to those who have completed Grade 12. There are two types of public universities that cater for post Grade 12 education. One is mandated specifically for teacher training for secondary school education, whilst the other focuses on science and other areas. Before independence, Mozambique had only one university, but after independence (1992), higher education expanded and there are now three Government universities and three private universities and institutions which provide higher education. Nevertheless, there is still a need for institutions of higher learning. As a result of the stiff competition for limited places at this level, all pupils have to sit an entrance examination.

2.2.2 Teacher Training

The lower primary school teacher training colleges (23), primary school teacher training institutes (11), and higher education institutions (1) were the main providers of teacher education. To qualify for entry into lower primary school (Grade 1-5) teacher training colleges, one has to hold a primary school certificate (Grade 7). Teachers who complete training in these colleges, teach in lower primary schools (Grades 1-5). In contrast, the entry qualification for primary school teacher training institutes is Grade 10. The teachers trained in these institutes can teach in both lower and upper primary schools (Grade 1-7), while teachers for both junior and senior secondary education are trained at universities.

2.2.3 Technical and Vocational Training

Technical and vocational training institutions equip students with skills that are required by industry and other sectors of the country's economy, and chiefly prepare the workforce needed for the social and economic development of the country. There are three types of vocational school. The first type offers courses for the commercial field (e.g. accountants and secretaries), the second offers courses for the industrial field (e.g. mechanics, welders and electricians) and the third offers courses in the agricultural field. Each type offers courses at two different levels, a basic and an intermediate level, each with a duration of three years. The basic level course is offered at technical and vocational schools whereas the intermediate level course is offered at technical and vocational institutes. Graduates from the institutes can attend universities in the same fields of study.

2.2.4 Educational Policy and Policy Reforms since 1995

Within the context of its overall development strategy, in 1995 the Mozambican Government adopted the National Education Policy, which established the policy framework for the National Education System. The National Education Policy identified the Government's main goals with regard to the education system as a whole, and defined specific policies for every sub-sector within the system.

While acknowledging that various educational needs have remained unfulfilled in the country, the Government nevertheless also recognised that the scarcity of financial and human resources would not allow all of the needs to be addressed at once. The National Education Policy therefore identified basic education (Grades 1 to 7) and adult literacy as the topmost priorities of the Government.

In its Strategic Plan for Education, the Ministry of Education (1998) stressed the priorities identified in the National Education Policy, amongst these goals being the increase of Mozambicans' access to basic education. The Strategic Plan for Education outlined the Ministry's fundamental objectives for basic education and identified the means by which the Ministry and its partners intended to move to accomplish them. The Strategic Plan for Education was rooted in a vision of an education system that was responsive to the needs and expectations of Mozambican citizens, and that was more closely aligned with the needs and requirements of the country's economy. The three main objectives of the education system proposed by the Strategic Plan for Education were:

- ❖ To increase access and educational opportunities at all levels of the education system for all Mozambicans;
- ❖ To maintain and improve the quality of education; and
- ❖ To develop an institutional and financial framework that would sustain Mozambican schools and pupils in future.

The central objective of the Strategic Plan for Education was to make access to primary education available to all Mozambican children. Additional objectives included improvements in the quality of basic education and in the establishment of a sustainable, flexible, and decentralised system in which responsibility would be widely shared with those who work at lower levels of the system and those whom it serves.

In order to improve the quality of education, the Ministry of Education and Culture has, since 1997, undertaken a process of curriculum transformation for basic education. The target year for the introduction of the new curriculum was 2004. Curriculum reforms in the secondary, technical and vocational and teacher training are also taking place. Another relevant change for improving quality has been the changes in the production of textbooks with the development of the National Book Policy, which involved the private sector in the process. This policy was expected not only to enhance the provision of books but also to ensure that the books were more responsive to the context of education in Mozambique.

2.2.5 The Administration of School Education

The Ministry of Education and Culture assumes overall responsibility for the administration of all public education institutions in Mozambique. The Minister of Education and Culture, the two Vice Ministers and the Permanent Secretary are at the apex of the Ministry. The Ministry of Education and Culture comprises nine national directorates:

- ❖ The National Directorate for Finance and Administration;
- ❖ The National Directorate for General Education;
- ❖ The National Directorate for Technical and Vocational Education;
- ❖ The National Directorate for Adult Education;
- ❖ The National Directorate for Human Resources Development;
- ❖ The Inspectorate;
- ❖ The National Directorate for Planning and Cooperation;
- ❖ The National Directorate for Culture; and
- ❖ The National Directorate for Special Programmes.

There is a Provincial Directorate of Education and Culture for each of the eleven provinces and this directorate falls under the leadership of a Provincial Director. Below the Provincial Directorate there is the District Directorate headed by a District Director for each of the 146 districts in Mozambique. Beneath the District Directorate, there is the school which is headed by a School Director. The inter-relationships amongst these role players at various levels are outlined in Figure 2.3.

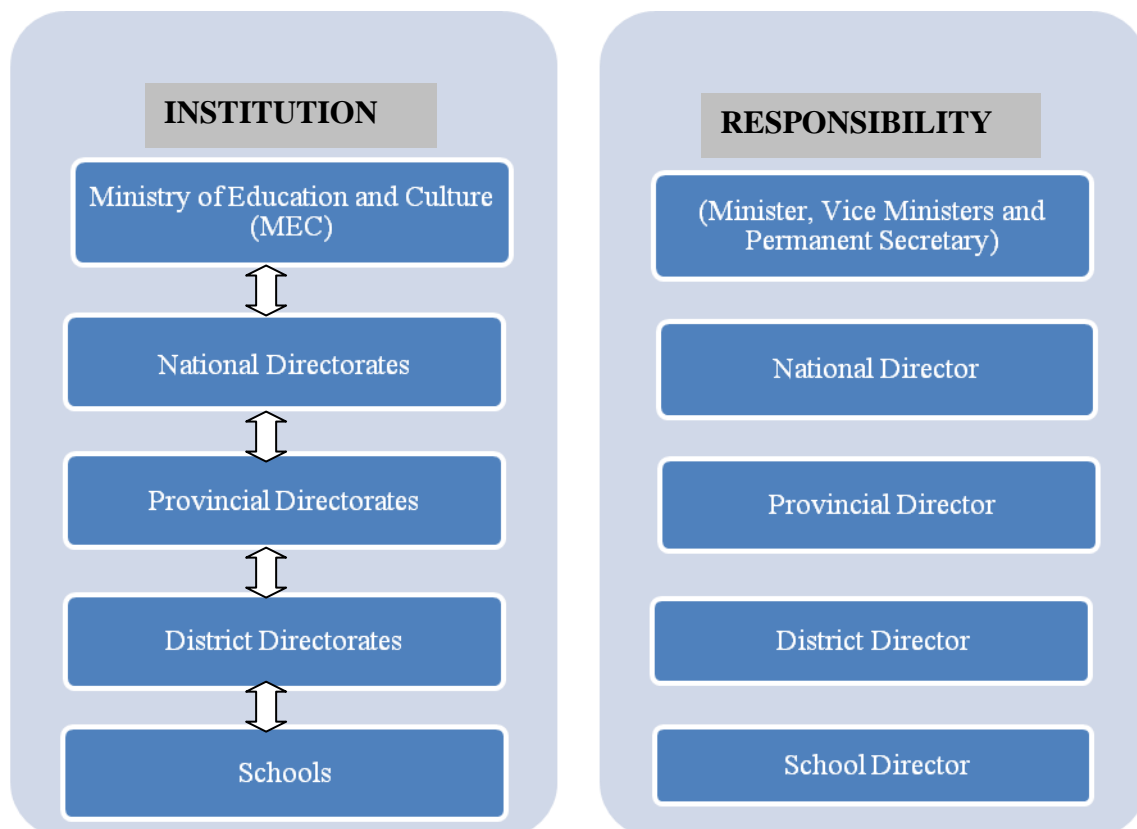


Figure 2.3 Levels of management and responsibility in the Ministry of Education and Culture

Five institutes report to the MEC, namely:

- ❖ The National Institute for Educational Development,
- ❖ The In-Service Teacher Training Institute,
- ❖ The Language Institute,
- ❖ The Adult Education Institute, and
- ❖ The National Institute for Cinema.

All national directorates and institutes fall under the leadership of the Minister within the Ministry of Education and Culture, and all are based in Maputo.

2.2.6 The Financing of Education

One of the fundamental challenges facing the Mozambican education system is the cost of expanding access and improving quality. According to the MEC (2003), education expenditure increased by 15% between 1999 and 2001. The Government has increased education's share of public expenditure from 18% to 20% in the same period.

2.2.7 The Gross Domestic Product (GDP)

In 2001, Mozambique spent the equivalent of 3.4% of its gross domestic product (GDP) on education. This is low in comparison with the average percentage in other developing countries, which spend about 3.9% of their GDP on education. The recurrent unit cost per Mozambican primary school pupil in 2001 was US\$28 whereas the average recurrent unit cost for sub-Saharan Africa was US\$143 (Passos, Nahara, Magaia and Lauchande, 2005).

Education has been the single largest category of recurrent investment expenditure, after road construction and maintenance. Considering that increasing the salaries of civil servants, including teachers, is one of the Government's short-term priorities, the share of public resources devoted to education is set to increase significantly, because the majority of public sector workers are teachers. Nevertheless, maintaining all of the current expenditure levels is beyond the means of the Ministry of Education and Culture, and a large proportion of the annual budget is consequently paid for with funds from abroad.

The Government has a number of external partners, the most important of which include the Swedish International Development Authority (SIDA), the Canadian International Development Agency (CIDA), the Danish International Development Agency (DANIDA), the Netherlands and

the World Bank. All have expressed their willingness to shift their assistance towards programme support for the implementation of the Strategic Plan of Education, which will be discussed later in the thesis.

In order to ensure the highest possible level of co-operation among external donors to education, the Ministry of Education and Culture convenes a meeting every year with representatives of the major financial and technical agencies involved in the sector. By so doing, the Ministry of Education and Culture is able to provide leadership and facilitate coordination among donors in the implementation of the Ministry's strategy.

2.2.8 The Main Policy concerns of the Ministry of Education and Culture

Three fundamental problems in the Mozambican education system are reported, and these affect all levels of the system and virtually all institutions at each level. The first concern is the limited access to education, the second is the poor quality of provision, and the third is the cost of expanding access and improving the quality of education (MINED, 1998). Each one of these is dealt with in greater detail below.

Limited access

Universal access to primary education was achieved shortly after independence, but enrolment dropped significantly in the subsequent years due to the economic crisis and the civil unrest experienced by the country. The gross enrolment rate in lower primary schools increased from 59% in 1988 to 92.1% in 2000. According to the MINED (2001) in 2000 there were as many as 7 072 schools for lower primary, but only 522 schools for upper primary. Consequently, only a small proportion of children were able to complete the full primary education cycle.

Opportunities are even more restricted in secondary and tertiary institutions and in technical and professional schools especially for girls and young women. In 2000 about 78 335 pupils were enrolled in 92 lower secondary (Grades 8 to 10) and only 3 316 in the 20 upper secondary schools (Grades 11 and 12). About 47% of pupils at this level were girls (Passos, Nahara, Magaia and Lauchande, 2005).

Quality of education

The quality of education provided in schools is perceived to be poor, as can be seen from the promotion rates, which have never been higher than 60%, the repetition rates, which have always been higher than 20%, and the dropout rates, which tend to be about 30%. This means that 25% to 30% of the pupils who annually attended EP1 were repeaters. Martins (1992) reported that out of

every 1 000 pupils enrolled in the first grade, only 77 successfully completed lower primary school (namely Grades 1 to 5) without repetition. Hence, for EP1 pupils to graduate, it is necessary to invest five times more than should theoretically be needed.

At the lower primary level, the average pupil/teacher ratio was 65:1 in the year 2000 (MINED, 2001) but it seems that the decline of education at the lower levels affects the progress of the students throughout the following levels and thus the whole education system. For example, the percentage of gross school enrolment by level from 2000 (MINED, 2001) is illustrated below, showing the decreasing number of students who progress through the Mozambican education system:

Lower Primary (Grades 1 to 5)	88.4%
Upper Primary (Grades 6 and 7)	8.1%
Junior Secondary (Grades 8 to 10)	3.0%
Senior Secondary (Grades 11 and 12)	0.4%

In addition to the above concern, common basic learning materials are scarce in or absent from many schools, and the quality of the educational facilities is often poor. Moreover, a large proportion of teachers at all levels are under-qualified for the posts they hold. Nearly a quarter of all teachers at lower primary level are untrained, and the majority have received only seven years of academic preparation in schools and three years of professional training thereafter (MINED, 1998).

The structure and content of the primary and secondary curriculum is increasingly inappropriate for the economic and social changes that have taken place. The curriculum is rigid and prescriptive in orientation, allowing few opportunities for local adaptation. There is a general perception amongst the stakeholders that much of what is taught in primary schools is of doubtful relevance and practical utility. As a result, the Ministry of Education decided to initiate the Transformation of the Curriculum for Basic Education as a first step towards the improvement of the quality of education in 1997 (MINED, 1998).

Costs of sustaining reforms

The third problem that emerges is that of the cost of sustaining expansion and improving quality within the present budget of the Ministry of Education, as the budget is considered to be largely inadequate. Maintaining the current system, with all of its problems, is beyond the means of the Ministry and a significant share of the annual budget is consequently met with funds provided by external partners (MINED, 1998).

2.3 PUPIL'S AND TEACHERS' PROFILES IN SCHOOLS IN 2000

The purpose of this section is to give an overview of teachers' profiles, pupil enrolments and pupils' performance in reading and mathematics in 2000, the year in which the SACMEQ fieldwork took place.

2.3.1 Grade 6 Pupil Enrolments

In Mozambique, 75% of the Grade 6 pupils were in urban schools in 2000, primarily because the majority of the Grade 6 and 7 schools were located in urban areas (Passos, Nahara, Magaia and Lauchande, 2005, p.41). Taking into consideration the location of the schools and the number of schools for EP2, the majority of the pupils do not have access to Grade 6, as there are fewer schools for EP2 than for EP1, and the rate of repetition is very high. Chapter 6 of this thesis discusses the SACMEQ study (2005) which reveals that Mozambique has a very high percentage of repetition, with 78.2% of pupils having repeated a grade at least once. The high rate of repetition is one of the obstacles to progression through the education system.

As indicated in Table 2.1, the variation in pupil enrolment in the year 2000 ranged from 20 710 pupils in Maputo Cidade to 5 012 in the province of Niassa. Zambézia and Nampula have the biggest populations but nevertheless did not have the highest enrolment. In all provinces, the number of boys enrolled at the beginning and at the end of the year was higher than the number of girls enrolled during the same period. Table 2.1 also shows the numbers and percentage of pupils by gender in Grade 6 at the beginning and end of the year, and the dropout and failure rate in 2000. The failure rate was calculated in relation to pupils at the end of the school year.

Table 2.1

Numbers of Mozambican pupils in Grade 6 at the beginning and end of the year, dropout and failure rate in 2000

Provinces	At the begin of the year			At the end of the year			Drop out %	Repeat rate %
	Boys/Girls	Boys	Girls	Boys/Girls	Boys	Girls		
Cabo Delgado	6.308	4 245	2 063	5 906	4 095	1 811	12.2	28.9
Gaza	12.544	6 590	5 954	12 106	6 372	5 734	3.7	31.8
Inhambane	13.146	7 353	5 793	12 687	7 168	5 519	4.7	36.4
Maputo Cidade	20.710	10 137	10 573	19 676	10 081	9 595	5.0	37.9
Manica	8.521	5 698	2 823	8 059	5 404	2 655	6.0	35.7
Maputo	11.461	8 638	5 650	10 940	5 494	5 446	7.3	27.9
Província								
Nampula	16.201	11 557	4 644	15 359	11 024	4 335	5.2	33.1
Niassa	5.012	3 580	1 432	4 427	3 145	1 282	11.7	21.6
Sofala	10.592	6 569	4 023	10.067	6 332	3 735	5.0	33.5
Tete	7.597	5 045	2 552	6 836	4 518	2 318	10.0	24.6
Zambézia	15.161	10 874	4 287	13 595	9 872	3 723	10.3	36.0
Mozambique	127 253	77 459	49 794	119 658	73 505	46 153	6.6	33.1

Source: MINED - Direcção de Planificação, 2001

The dropout rate in Mozambique was 6.6% on average. Cabo Delgado had the highest rate of dropout (12.2%), despite having the lowest enrolment rate, followed by Niassa (11.7%) and Zambézia (10.3%). Gaza had the lowest dropout rate (3.7%). The repetition rate in 2000 was 33.1% on average, and varied from 37.9 % in Maputo Cidade to 21.6% in Niassa.

2.3.2 Grade 6 Pupil Performance

Table 2.2 below shows the numbers and percentages of pupils by gender that passed Grade 6 at the end of the year. The percentages were calculated in relation to pupils at the end of the school year.

Table 2.2

Numbers and percentages of Mozambican pupils who passed the Grade 6 school year

Province	Pass					
	Boys/Girls	%	Boys	%	Girls	%
CAB	4.202	71.1	2.905	70.9	1.297	71.6
GAZ	8.254	68.2	4.379	68.7	3.875	67.6
INH	8.070	63.6	4.660	65.0	3.410	61.8
MAC	12.219	62.1	6.120	60.7	6.099	63.6
MAN	5.182	64.3	3.591	66.5	1.591	59.9
MAP	7.893	72.1	4.100	74.6	3.793	69.6
NAM	10.272	66.9	7.397	67.1	2.875	66.3
NIA	3.471	78.4	2.482	78.9	989	77.1
SOF	6.694	66.5	4.367	69.0	2.327	62.3
TET	5.152	75.4	3.486	77.2	1.666	71.9
ZAM	8.700	64.0	6.311	63.9	2.389	64.2
MOZ	80.109	66.9	49.798	67.7	30.311	65.7

Source: MINED - Direcção da Planificação, 2001

The national boys and girls pass rate at the end of 2000 was 66.9%. Niassa had the highest pass rate for boys and girls (78.4%) while Maputo Cidade had the lowest (62.1%). The percentage of boys that passed was slightly higher than the percentage of girls: 67.7% and 65.7% respectively.

Taking the role of gender in performance into consideration, it is apparent that boys performed better than girls in most provinces with the exception of Maputo Cidade (60.7% pass rate for boys and 63.6% for girls), Cabo Delgado (70.9% pass rate for boys and 71.6% for girls) and Zambézia (63.9% pass rate for boys and 64.2% for girls). The percentage of boys that passed ranged from 60.7% in Maputo Cidade to 78.9% in Niassa. In the case of girls, the percentage ranged from 59.9% in Manica to 77.1% in Niassa.

Table 2.3 shows the levels of achievement in Portuguese and mathematics. The Mozambican grading system provides scores from zero to 20 marks. Pupils achieving less than 10 marks (9 or below), that is a percentage between 0 and 45%, fail the examination. Scores between 10 and 13 marks (50 to 65%) are considered satisfactory, while marks from 14 to 20 (66% and above) are considered very good.

Of the pupils that reached the end of the year, 25.8% failed Portuguese, as they achieved marks that ranged from zero to nine. More than two-thirds (68.8%) passed with scores between 10 and 13, which corresponds to a satisfactory level, whilst only 5.4% had good or very good marks in Portuguese. This percentage is confirmed by the SACMEQ II study (2005) tests, reported in Chapter 7, in which only a small percentages of pupils reached Level 7 (see Chapter 7) and none achieved Level 8, the highest level. However, the majority of pupils achieved a middle level

position. The percentage of pupils that failed Portuguese in Grade 6 ranged from 30.2% in Zambézia to 19% in Tete province. Zambézia had the highest rate of pupils that failed, followed by Sofala (28.9%) and Inhambane (28.4%).

2.3.3 Grade 6 Pupil Performance in Reading and Mathematics

Overall, the majority of Mozambican pupils (68.8%) performed at a satisfactory level with marks between 10 and 13 for Portuguese as a subject.

Table 2.3

Achievement of Mozambican pupils in Grade 6 in Portuguese and mathematics in 2000

Prov.	PORTUGUESE						MATHEMATICS					
	0-9	%	10-13	%	14-20	%	0-9	%	10-13	%	14-20	%
CAB	1294	21.9	4189	70.9	423	7.2	1332	22.6	4129	69.9	445	7.5
GAZ	2901	24.0	8561	70.7	644	5.3	2932	24.2	8199	67.7	975	8.1
INH	3609	28.4	8002	63.1	1076	8.5	3671	28.9	7416	58.5	1600	12.6
MAC	5279	26.8	13175	67.0	1221	6.2	6138	31.2	12264	62.3	1274	6.5
MAN	2116	26.3	5656	70.2	286	3.6	2249	27.9	5229	64.9	582	7.2
MAP	2295	21.0	8203	75.0	442	4.0	2456	22.4	7620	69.7	864	7.9
NAM	4129	26.9	10626	69.2	604	3.9	4370	28.4	10336	67.3	654	4.3
NIA	892	20.1	3048	68.9	487	11.0	878	19.8	2785	62.9	764	17.3
SOF	2908	28.9	6763	67.2	396	3.9	2859	28.4	6602	65.6	605	6.0
TET	1300	19.0	5087	74.4	449	6.6	1208	17.7	5023	73.5	605	8.8
ZAM	4107	30.2	9020	66.4	468	3.4	4210	31.0	8695	64.0	690	5.1
MOZ	30829	25.8	82332	68.8	6 497	5.4	32301	27.0	78298	65.4	9 058	7.6

Source: MINED - Direção da Planificação, 2001

Legend: 0-9 = Fail; 10-13 = Satisfactory; 14-20 = Very Good

The percentage of pupils that performed at the satisfactory level did, however, vary from 74.4% in Tete to 63.1% in Inhambane. In relation to the breakdown of pupils performing at a ‘very good’ level with marks from 14-20, the provincial percentage data ranged from 11% in Niassa to 3.4% in Zambézia.

In terms of performance in mathematics, 27% of all Mozambican pupils had marks that ranged between 0 and 9, 65.4% had marks between 10 and 13, while 7.6% of pupils had ‘very good’ scores of 14 to 20 marks. In comparison with their overall results for Portuguese, there were a higher percentage of pupils scoring at the lowest and highest levels in mathematics. The percentage of pupils who failed Grade 6 mathematics ranged from 31.2% in Maputo Cidade to 17.7% in Tete province. Maputo Cidade had the highest rate of pupils who failed mathematics, followed by Zambézia (31%) and Inhambane (28.9%). The percentage of pupils that performed at level 10-13

varied between 73.5% in Tete and 58.5% in Inhambane. In the level 14-20 range of marks, the percentage ranged from 17.3% in Niassa to 4.3% in Nampula.

Maputo Cidade is a large city and the pupils, generally speaking, had a higher socio-economic status than those in Cabo Delgado and Niassa. However, pupil results for the year 2000 in Portuguese and mathematics were not consistent with the usual tendency for pupils from large towns or higher socio-economic status, who tend to perform better than pupils from rural areas or with lower socio-economic status. Some provinces, such as Cabo Delgado and Niassa, presented higher marks in Portuguese and mathematics than Maputo Cidade. These results were also not consistent with the SACMEQ results (see Chapter 7), in which Cabo Delgado and Niassa had the lowest percentage in pupil success.

The MEC tests assess reading and grammar, while the SACMEQ tests assess reading competence but, even taking into consideration the different purposes of the two tests, the results cannot explain the difference in pupil performance.

2.3.4 The Profile of the Cohort of Teachers in Mozambique in 2000

The Ministry of Education and Culture has introduced many models of teacher training since 1975, as will be explained later. Table 2.4 shows the profile of the cohort of teachers in 2000, the year in which the SACMEQ fieldwork took place.

The Ministry of Education and Culture grouped teachers according to the level of entrance academic qualifications, that is, the level of general education achieved before entering a teacher training course. For instance, there are three levels of teachers namely: *Basic*, which comprises teachers who enter the teacher training college with Grade 5 or 7; *Middle*, which comprises teachers who enter the teacher training college with Grade 10; and *Upper*, which comprises teachers who enter the university with Grade 12. Only the middle group is qualified to teach in upper primary, Grade 6 and Grade 7, with the exception of middle group teachers with *Magistério Primário* (middle group) who are qualified to teach in lower primary from Grades 1 to 4.

Table 2.4

The profile of teachers in 2000 in Mozambique

Group levels of Teacher	Professional training	Year 2000							
		Course Characteristics			Sex				
		Entr. level	Dur.	Gr.to teach	Male No.	Female No.	%	Total No.	%
Basic Level	EHPP *	4	4	1-5	20	5	0.08	25	0.4
	CFPP	7	2	1-5	145	18		163	
	CFPP	7	3	1-5	251	58	0.9	309	4.9
Total					416	81	1.3	497	8.0
Middle level	MP *	10	2	1-5	67	26	0.4	93	1.4
	EFEP	8	2	6-7	346	74	1.1	420	6.7
	UEM	10	2	6-7	16	2	0.03	18	0.2
	IMP	10	2	6-7	421	114	2.3	535	8.6
	IMP	10	3	6-7	1 104	397	6.4	1 501	24.1
	IMAP	10	2	1-7	361	150	2.4	511	8.2
Total					2 315	763	12.3	3 078	49.6
High level	UEM	12	2	8-10	26	6	0.09	32	0.5
	UEM	12	2	11-12	27	6	0.09	33	0.5
	UP Bacharelato	12	3	8-12	62	26	0.4	88	1.4
	UP Licenciatura	12	5	8-12	9	10	0.16	19	0.3
Total					124	48	0.7	172	2.7
Others	Physical Ed.	10	3	6-12	144	9	0.14	153	2.4
	Other	-	-	-	126	42	0.67	168	2.7
	Foreign	-	-	-	21	23	0.37	44	0.7
Total	Untrained	-	-	-	1 861	230	3.7	2 091	33.7
TOTAL					5 007	1 196	19.2	6 203	99.8

Source: MEC - Direcção dos Recursos Humanos * Courses undertaken before independence

Legend: Entr.=Entrance; Dur.=Duration; Gr.=Grade; EHPPE=Escola de Habilitação de Professores do Posto Escolar; MP=Magistério Primário; CFPP=Curso de Formação de Professores Primários (Primary teacher training course); EFEP=Escola de Formação e Educação de Professores; IMP=Instituto Médio Pedagógico; UEM=Universidade Eduardo Mondlane; IMAP=Instituto do Magistério Primário; UP=Universidade Pedagógica; Bacharelato=Bachelor; and Licenciatura=Degree

As can be seen from Table 2.4 above, in 2000 Grade 6 was taught by 6 203 teachers of whom 5 007 were male and 1 196 were female. Some 2 091 of the teachers had no professional training and the others had different types of training as listed in the table. In 2000, the year of the SACMEQ study, the professional training in upper primary education varied from CFPP, which qualified teachers to teach in lower primary education, to “Licenciatura” (a degree) which prepared teachers to teach in secondary education.

The lower level - comprised teachers who have an academic qualification of Grade 7 and two to four years of training. This qualified them to teach in lower primary education from Grades 1 to 5. There were 497 teachers in this group, of whom 416 were male and 81 female. Teachers at this level were qualified to teach lower primary and are from:

1. EHPPE – Escola de Habilitação de Professores do Posto Escolar (Teacher Training School);
2. CFPP – Curso de Formação de Professores Primários (Primary Teacher Training).

However, because of the teacher shortage, some of these teachers taught in the upper primary grades, and they represent 8% of the total number of teachers in upper primary education. Given the low level of their qualification, teachers could have faced some problems in teaching the subject matter.

The middle level - comprised teachers who had an academic qualification of Grade 10 and two or three years of professional training. They were supposed to teach in lower and/or in upper primary education. For instance, teachers from:

1. MP (Magistério Primário) could teach from Grades 1 to 5;
2. IMAP (Instituto Magistério Primário) could teach from Grades 1 to 7;
3. EFEP (Escola de Formação e Educação de Professores) could teach from Grades 1 to 5;
4. IMP (Instituto Médio Pedagógico) could teach from Grades 6 to 7;
5. UEM (Universidade Eduardo Mondlane) could teach from Grades 6 to 7.

In the year 2000, this group consisted of 3 078 teachers, of whom 2 315 were male and 763 were female. These teachers represented 49.6% of the total number of teachers in upper primary education. Of these, 48.1% had specific professional training to teach in upper primary education.

The higher level - comprises teachers, who have “bacharelato” (bachelor) and “Licenciatura” degrees as professional qualifications and they are supposed to teach in junior secondary education and senior secondary education. For instance, teachers from:

1. UEM and Universidade Pedagógico (UP) (graduates) can teach from Grades 8 to 10;
2. UEM and UP (graduates) can teach from Grades 11 to 12.

Only 172 teachers, 124 male and 48 female, had higher qualifications. They are exceptional at this level, because there tends to be a lack of teachers with higher qualifications in secondary education. The presence of the teachers with a higher level qualification could be related to the schools' being located in towns. In rural areas, they face problems related to their accommodation and the availability of electricity and water, and they prefer to stay in towns where the conditions are better than in rural areas. Those teachers represent 2.1% of the total of teachers in upper primary

education. A further group comprises teachers, who have different types of professional training or none at all. In the year 2000, this group consisted of 2 456 teachers, of whom 2 152 were male and 304 female. Those teachers represented 39.5% of the total number of teachers in upper primary education and untrained teachers represented 33.1% of the total number of teachers in upper primary education.

The majority of teachers (3 218) does not have specific training for this level. This fact can be explained on the one hand by the several models of teacher training introduced by the MEC, and on the other by the fact that qualified teachers tend to leave the profession because of the poor level of job satisfaction. In noting the number of years of experience of teachers in the SACMEQ study, where teachers in Mozambique had on average only 9.9 years of experience, it seems that this occurrence could be explained.

There was a major imbalance in terms of gender among upper primary school teachers. One of the reasons appears to be the location of the teacher training colleges and the upper primary schools. These institutions of education are usually located in cities or small towns, as suggested by the following statement: “Pupils graduating from lower primary schools had to go to other areas to continue with their education. Usually, parents are reluctant to send their girl children to hostels since the conditions in most hostels are unfavourable. In general, buildings are in bad condition and they frequently have poor sanitary conditions, are overcrowded, have poor dietary provisions and are poorly supervised” (Passos, Nahara, Magaia and Lauchande, 2005, p.31), which suggests that conditions for girls to continue their education are unattractive, a fact that deters them from seeking access to tertiary education.

The teacher profile in 2000 is consistent with the profile presented in the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) study carried out in 2000 and presented in this thesis in Chapter 6. That is, the average professional training that teachers had was 1.8 years in reading and 1.9 years in mathematics; 4% of reading and 2.7% of mathematics teachers had benefitted from primary education only, and only 0.3% of reading teachers received tertiary education.

The fact that teachers have low levels of qualification or are without professional training tends to contribute to pupils’ weak performance. Châu (1996, p.186) states that “classroom observations in the different countries show that certain teachers have an insufficient mastery of the subject matter they teach. In addition many of them lack the pedagogical know-how required for good presentation of the material,” a point reinforced by Shulman (1986) who discusses the importance of the development of pedagogical content knowledge.

Several issues were raised in some of the workshops conducted for Mozambican teachers to introduce a new curriculum project (2004). These issues included:

1. Teachers' understanding of the learning process;
2. The assessment of pupils' work;
3. Methodology; and
4. Language or terminology.

The fact that teachers perceive these elements to be areas of difficulty is seen as a consequence of different types of teacher training models applied to their training from time to time and the influence of expatriates from different countries with varied teaching experience and using different methodologies and languages. These factors also militate against teachers' being able to work as a team at school level.

2.4 TEACHER TRAINING POLICIES AND PRACTICES IN MOZAMBIQUE

The Ministry of Education and Culture has introduced many different models of teacher training in Mozambique since 1975. Table 2.4, illustrating the 2000 profile of Mozambican teachers, revealed that they had followed a variety of education curricula according to the period in which they had trained. The purpose of this section is to give an overview of the teacher training policies and practices in Mozambique. This information is presented for two reasons. The first is that it presents a context for subsequent analysis and interpretation of teacher performance presented in Chapters 7 and 8. The second is that a teacher's profile can be related to the teachers' performance.

2.4.1 Teacher Training Policies

There are two common reasons for curriculum change in teacher education. One is the need to conform with political changes and the other is the need to improve the quality of teaching. Changes were introduced in Mozambique in 1975 to adjust to new policies and goals in education, but in recent years, the main reason for change has been to improve the quality of education.

Mozambique had two systems of teacher training before independence. One of these was the "Escolas de Habilitação Formação de Professores do Posto Escolar" (EHPPE), a four-year programme for which the entrance requirement was Grade 4. This learning programme included academic subjects the purpose of which was to improve student knowledge to the equivalent of Grade 7, and professional training. The other was the "Magistério Primário," where the entrance

requirement was Grade 10 and the training lasted for two years. Teachers from both courses were then equipped to teach in primary education from Grades 1 to 4.

Since independence, from 1976 onwards, the Ministry of Education and Culture has implemented many different teacher training models, but at present it does not have an ideal model for a teacher training programme. In 1976 the MEC transformed the EHPPE into the Curso de Formação de Professores Primários (CFPP's). From that point on, many variants of the model were produced, as shown below (Guro, 1997, p.50):

1. 1976: entrance Grade 6 and duration 6 months;
2. 1979: entrance Grade 6 and duration 1 year;
3. 1990: entrance Grade 7 and duration 3 years.

Graduates from these courses of teacher training were meant to teach lower primary school.

In 1978, the MEC discontinued the “Magistério Primário” and introduced a new course, the “Escola de Formação e Educação de Professores” (EFEP). The entrance requirement for this learning programme was Grade 8. It was later designated the “Instituto Médio Pedagógico” (IMP) and the entry requirement was increased to Grade 10. The duration of this course was three years. Teachers who were successful in this course could teach in upper primary education Grades 6 and 7. This course closed when the MEC established the “Instituto do Magistério Primário” (IMAP). In 1996, the MEC introduced a new course, the IMAP, for which the entrance level is Grade 10. It has a duration of two years, and graduates from this course can teach from Grades 1 to 7.

In the early years of independence the responsibility for defining policy and designing teacher training curricula lay with the National Directorate of Teacher and Cadre Training, then it moved to the National Directorate for Basic Education (DINEB), and since 1997 it rests with the National Institute for Educational Development (INDE).

In 1992, the Government changed some principles and goals in order to adjust the education system to the new political context, and stated that:

1. *Education is a right and duty for all citizens*
2. *The State allows the participation of other entities, including communities, cooperatives, businesses and private institutions, in the education process*
3. *The State organizes and promotes education*
4. *Public education is secular* (Boletim da República I série nº 19, pp.104-108).

The same document recommends as goals for teacher training that it:

1. *Ensures an integral education of teachers, empowering them to assume the responsibility of educating the youth and adults*
2. *Provides the teacher with solid scientific, psycho-pedagogic and methodology training*
3. *Allows the teacher to constantly elevate his level of scientific, technical and psycho-pedagogic training (Boletim da República I série n° 19, pp.104-112).*

Currently, Teacher Education takes place at the Lower Primary School Teacher Training Colleges (CFPP) and Primary School Teacher Training Institutes (IMAP).

2.4.2 Teacher Training Practice in Mozambique

When the National Directorate for Basic Education (DNEB) in 1990 was mandated by the Ministry of Education and Culture to guide and coordinate the design, development and implementation of the reformed teacher education programme for basic education, the DNEB organized a task force consisting of various stakeholders at central level to address the reform of pre-service teacher education. The majority of the stakeholder representatives had no training and experience in primary education or experience in teacher training.

The DNEB (1996, p.4) defined the goals for teacher training as:

1. *To develop a general culture which will enable the trainee to assume his or her role as a teacher.*
2. *To promote the acquisition of scientific pedagogic knowledge that is the basis for educative action.*
3. *To provide sound knowledge in theory and in primary education subjects.*
4. *To develop attitudes for intervention in different socio-educative contexts.*

The group defined three principles for IMAP teacher training (DNEB, 1996, p.4):

1. *Articulation between theory and practice seen from an integrated perspective.*
2. *Transparency and isomorphism in teacher training.*
3. *Innovation and research in teacher training.*

The IMAP programme was introduced in 1996 and was the most recent change in the teacher training programme and the first one to train teachers to teach from Grades 1 to 7. All applicants have to be at least 16 years of age and have a Grade 10 education, and all of them have to sit an entry exam. The course is a two-year full-time programme designed to prepare students to become competent teachers. The programme is structured into four semesters of 18 weeks each. However, the specialization for upper primary education is not clearly outlined in the policy document.

The evaluation of CFPP (Passos and Cabral, 1989) and IMAP (Passos, Navesse and Chiau, 2000) showed that there were problems in the implementation of the intentions of the policy at the colleges. For example, it is not possible to train a competent teacher for primary education without practical work in primary schools and with trainers who have had neither training nor experience in primary education. The MEC (1998, p.9) recognises that the quality of education and training provided in the institutions is often poor. “Teachers at all levels are often under qualified for the posts they hold. Nearly a quarter of all teachers in EP1 are entirely untrained, and the majority has received only six years of schooling and one year of professional training.” For these reasons, the MEC defined as its priorities the expansion of access to education, the improvement of the quality of the provision of education, and the sustaining of these two programmes of action over a period of time, and where teacher training is part of this programme.

2.5 SUMMARY

Mozambique has had several models of teacher training since independence. The weakness of the education system can be attributed to some extent to the lack of a coherent teacher training policy. Because the decision-makers did not take into consideration the results of research in the teacher training field, the new policies and programmes have tended replicate the problems inherent in the previous policies and programmes.

Swarts (2002, p.10) highlighted that “policy failure can often be attributed to the view that implementation is separate from policy makers who, in general, underestimate the complexity and difficulty of coordinating the tasks and players involved in implementing programmes and policies.” Swarts goes on to explain that in order for policy to be effective, “policy formation must be seen as a social and political process, as well as a task of technical planning and analysis” (2002, p.11).

The goal defined in the new policy in Mozambique is to develop in trainees the competency needed to teach in primary education. Hence, competency for the teaching profession or a level of teacher

performance, which can be described and evaluated, should reflect identifiable knowledge, skills and attitudes, and appropriate personal attributes, within a specific curricular or professional area.

To reach the above-mentioned goals, the quality of primary school teacher training, both academic and professional, should be given great emphasis as training plays an important role in improving the quality of education. Swarts (2002) cautions that we need to take into consideration the many changes that have happened in teacher training and that “it is important to undertake a deeper analysis to identify the consequences of several changes in the teacher training programme” (2002, p.15).

The next chapter reviews the relevant literature in an attempt to find answers to the research questions with regard to teacher competence and its relationship to pupil performance in the Mozambican context, and an overview will be presented of pupil performance in reading and mathematics in cross-national studies such as the SACMEQ study.

CHAPTER 3

LITERATURE REVIEW

INTRODUCTION

A review of the relevant literature is presented and discussed in this chapter in order to be informed about previous studies, to identify gaps in the literature, and to address the issue of teacher competence and its relationship to pupil performance in the Mozambican context. In addition, pupil performance in reading and mathematics in cross-national studies is examined.

The review is informed by the main research questions for this study:

1. What is the relationship between teacher competence and pupil performance in reading and mathematics in upper primary schools in Mozambique?
2. How does the relationship between teacher competence and pupil performance in mathematics and reading compare across the different countries in the Southern Africa Consortium for Monitoring Educational Quality (SACMEQ)?

The general information that is presented in Section 3.1 of this chapter is a reflection of various ways in which teacher competence is understood. In Section 3.2, the thinking about competence in the field of teacher training is presented and discussed, followed by a discussion of competence as part of teacher effectiveness. Section 3.3 deals with the assessment of teacher competence, Section 3.4 has to do with the relationship between teacher competence and pupils' performance, Sections 3.5 and 3.6 present pupils' performance in cross-national studies in reading and mathematics, and the conclusion, Section 3.7, summarises the chapter.

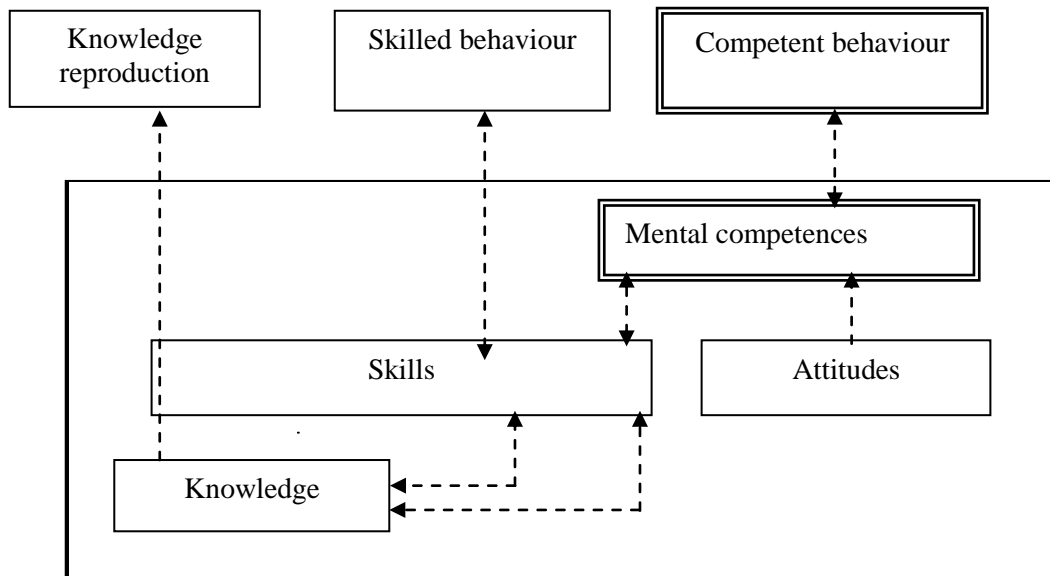
3.1 UNDERSTANDING COMPETENCE

Competence is usually associated with highly professional performance and there is a direct link in the field of education between a teacher's professional competence and pupil performance.

There are two distinct meanings of 'competence' in education. From a theoretical point of view, competence is understood as a cognitive structure that facilitates specified behaviours. From an operational point of view, competence seems to cover a broad range of higher-order skills and

behaviours that represent the ability to deal with complex, unpredictable situations. This operational definition includes knowledge, skills, attitudes, metacognition and strategic thinking, and presupposes conscious and intentional decision making (Westera, 2001).

In Figure 3.1, Westera (2001) offers a schematic view of the common operational definition of competence.



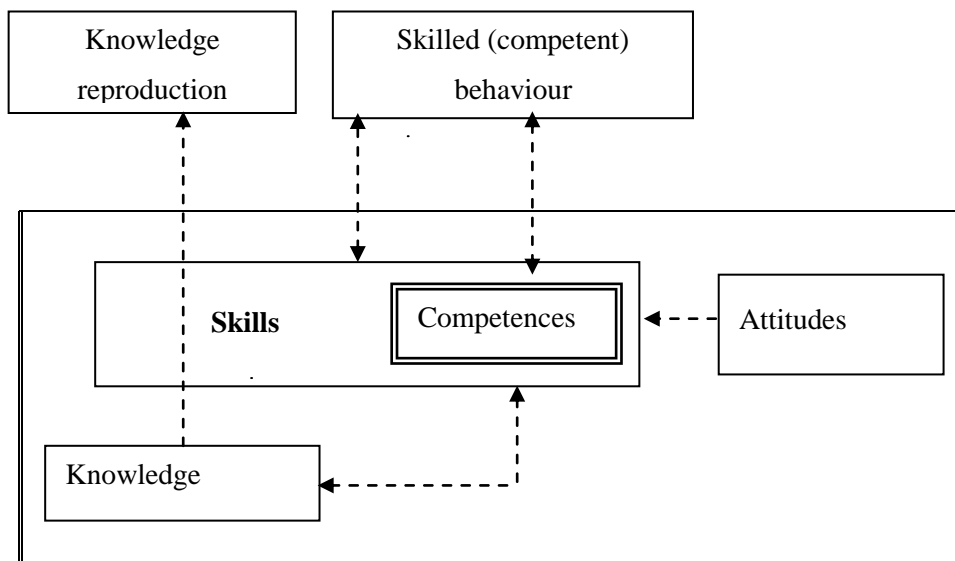
Source: Westera, 2001, p.80

Figure 3.1 A competence model, according to common definitions

The general concept of operational competence, according to Westera (2001), can be explained as follows: “An individual’s cognitive structures contain considerable theoretical and practical knowledge. This knowledge can be made available to the outside world by way of reproductive skills (i.e. speech, writing, pointing, etc.), or can become supportive to skills and the associated skilled behaviour” (p.81). The same writer stresses that in complex non-standard situations, competences combine knowledge (or the cognitive), skills and specific attitudes. Competences have a mental component involving thought and a behavioural component involving competent performance. But our understanding of the true nature of competence should go beyond the aspects of knowledge, skills and attitudes, because something ‘extra’ seems to be necessary to ensure effective and efficient performance. Competent individuals should be able to make the right choice out of a variety of different possible behaviours by anticipating the effects of their intervention.

As Westera explains (2001, p.85) competence is a complex concept. Competence may be “decomposed” into contributing sub-competences. The sub-competences can be “decomposed” too and this process can go on, several times. The “decomposition procedure” results in a hierarchical structure of conditional sub-competences that become more specific and limited as one goes down the hierarchy. Eventually, there comes a stage in which the sub-competences are identical with the supporting skills. While maintaining the idea of skills as being different from competences, we should also acknowledge that skills themselves can also be “decomposed” into a hierarchical system of sub-skills.

According to the same author, there are two problems with this description of the concept of competence: Firstly, it tries to set cognitive standards for behaviours that cannot be standardized. Secondly, from a research point of view, competences make up a sub-category of cognitive skills; the idea of “competence” as a distinct category different from “cognitive skills cannot be sustained.” Accordingly, the competence model of Figure 3.1 has been modified in Figure 3.2 below:



Source: Westera, 2001, p.86

Figure 3.2 Competences as sub-skills

However, this debate about the description does not mean that the term competence should not be used. The term might also be reserved to indicate that the associated knowledge and skills originate

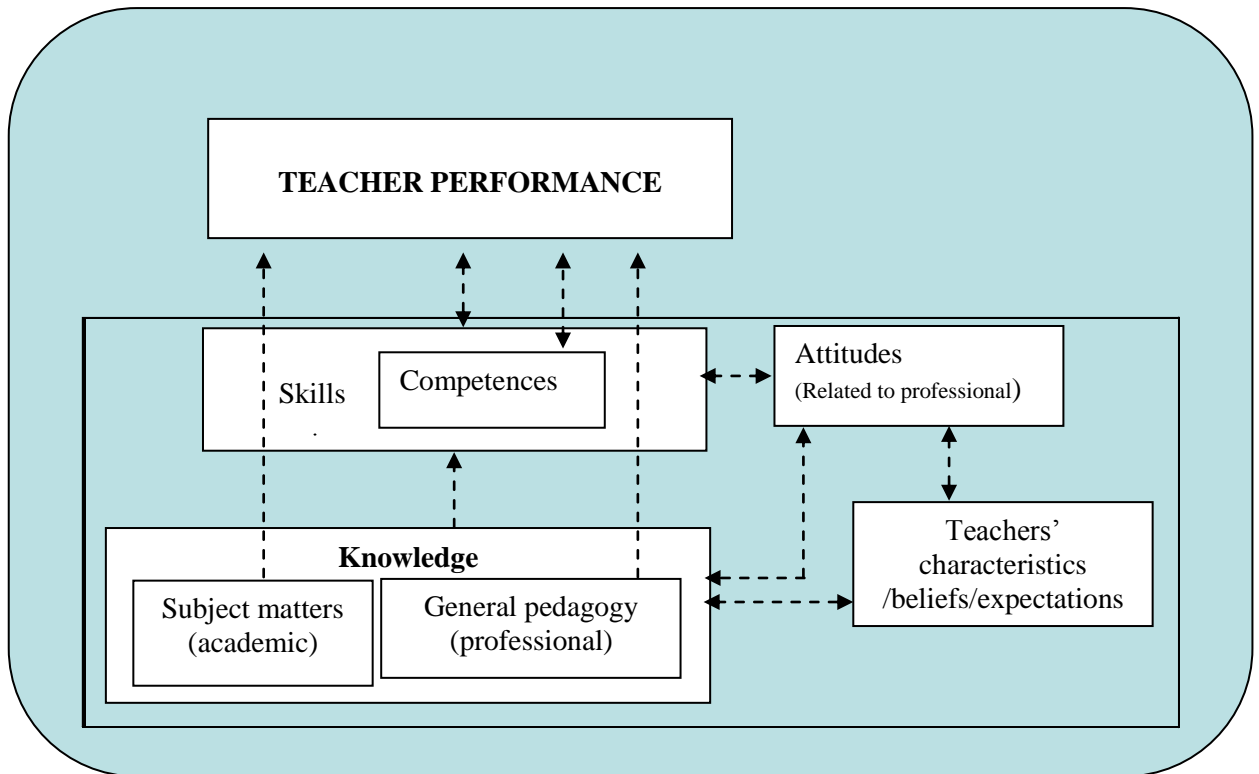
from a professional practice. But when all is said and done the only determinants of human abilities are knowing (the cognitive), feeling (attitudes) and doing (skills) (Westera, 2001, p.87).

A number of authors describe competence as relating to an action, behaviour or outcomes that can be demonstrated, observed and assessed. According to Tomlinson (1995, p.181) “competence or skill signifies a more or less consistent ability to realise particular sorts of purposes to achieve desired outcomes.” A competent person is capable of certain acts or actions. Such a person is capable of the actions required to achieve an intended outcome. The concept of competence, as explained by Westera (2001), is strongly associated with the ability to master complex situations, and goes beyond the levels of knowledge and skills to include an explanation of how knowledge and skills are applied in an effective way.

In a much broader sense, competence is a highly valued quality that accounts for the effective use of knowledge and skills in specific and concrete contexts. The mastery of relevant knowledge and skills alone is no guarantee of successful performance in complex environments. Individuals should be able to select from their available knowledge and skills in such a way that efficient and effective behaviour occurs which requires special “abilities” that take into account the characteristics of a specific context (Westera, 2001).

3.2 TEACHERS AND ISSUES OF COMPETENCE

A number of researchers such as Fraser (2000), Norris (1991), Short (1985) and Popham (1986) have proposed frameworks for domains of teacher knowledge. When one adapts Westera’s model (2001) to the context of teaching the following diagram results:



Source: adapted from Westera, 2001

Figure 3.3 Competences as sub-skills in the teacher's context

In examining this diagram, it can be said that a teacher's performance depends on the teacher's knowledge, (comprised of subject matter and general pedagogy), which is directly linked to the teacher's competences, characteristics and attitudes. Grossman's (1995) explanation of teacher knowledge matches the adapted Westera model which means that teacher knowledge comprises subject matter and general pedagogy. Subject matter is vital for good teaching and teacher performance as "qualitative research suggests that teachers' knowledge of the content they teach affects both what teachers teach and how they teach it" (Grossman, 1995, p.6118). Subject matter then links with general pedagogy, which includes "knowledge about classroom organization and management, general knowledge of lesson structure, and general methods of teaching. Lack of professional training affects the level of teachers' performance" (Grossman, 1995, p.6118).

The above ideas are reinforced by a reading of Shulman (1986), who discusses three kinds of knowledge: content knowledge, pedagogical content knowledge (PCK), and curriculum knowledge. Content knowledge refers to "the amount and organization of knowledge per se in the mind of the teacher" (p.9). The author stresses that teachers must not only be capable of defining the content or concepts for learners, but they must also be able to explain why and how these concepts relate to other concepts or content, as well as be able to explain why a particular

proposition is deemed warranted. The knowledge of pedagogical content goes beyond the knowledge of subject matter per se to the dimension of knowledge of the subject matter for the purposes of teaching. Finally, curricular knowledge is knowledge of the full range of the programmes designed for the teaching of particular subjects and topics at a given level, the variety of instructional materials in relation to those programmes, and the set of characteristics that serve as both indications and contra-indications for the use of particular curriculum or programme materials in particular circumstances (pp.9-10).

Medley and Shannon (1994) develop the concept of professional knowledge. They define professional knowledge as consisting of knowledge about the kinds of teacher behaviour which is known to be effective in helping students progress toward important educational goals. But they also indicate that other factors that affect the level of teacher performance in primary education are the levels of knowledge about the specific subject methods. Medley and Shannon (1994) emphasize the two components of teacher knowledge when they stress that “Competence to teach is defined in terms of possession of two kinds of knowledge, knowledge of subject matter and professional knowledge, and training programmes are developed to help students become competent in this sense” (Medley and Shannon, 1994, p.6020). Consequently, for improved teacher performance in primary education it is essential that such aspects as subject matter or professional knowledge and general pedagogy be considered for inclusion in the teacher training programme.

3.3 THE IMPORTANCE OF TEACHER TRAINING IN DEVELOPING PROFESSIONAL COMPETENCE

Many factors contribute to the quality of teaching, such as the professional competence of the teacher, which includes subject matter knowledge, pedagogical content knowledge, knowledge of teaching and learning, curricular knowledge, teaching experience, and certification status (Shulman, 1986, Grossman, 1995, Westera, 2001). Darling-Hammond’s (1999) findings indicate a consistent and significant positive relationship between the proportion of well-qualified teachers and student achievement on the National Assessment of Educational Progress (NAEP) reading and mathematics assessment.

Teacher effectiveness depends on how well a teacher performs in the classroom, and this is dependent on how competent the teacher is. The literature (Chapman and Mähleck, 1997, Kanu, 1996, Châu, 1996) emphasises the importance to the performance of the pupils of the quality of teacher who has well developed subject knowledge, pedagogical content knowledge and curriculum knowledge. In the Mozambican context, the nature of the learning outcomes depends on

the level of teacher competence, and teacher competence depends in turn on the teacher training curriculum, the level of competence of the trainer, and that of the mentor at the school to which the teacher is assigned.

According to Chapman and Mählck (1997) pre-service training is “the single most widely employed strategy (by itself or with other strategies) to improve instructional quality. This comes as no surprise. One of the most widely held beliefs underlying both national and international educational development activities is that the most direct and efficient way to improve instructional quality is to improve the content pedagogical expertise of teachers through increased levels of training.” Shulman (1986) reinforces this idea by stating that all three types of knowledge, content knowledge, pedagogical content knowledge and curricular knowledge should be included in pre-service teacher training programmes.

Many researchers, such as Sander and Horn (1998) and Raudenbush, Eamsukawat, Di-Ibor; Kamali and Taoklam (1993), confirm that teachers should clearly become the vanguard in the effort to improve pupils’ performance. The Holmes Group study on educational reform (in Kanu, 1996) gave recognition to the importance of teachers in educational reform when it indicated that the quality of learning in schools depends on the quality of teachers with the crucial role of the teacher in bringing about meaningful educational change being acknowledged in developed and developing countries alike. It is the teacher who is the key to educational quality. Excellent curricula, materials, infrastructure and administration will not improve the quality of education if the quality of teaching is poor. Conversely, good results can be achieved with quality teaching even with poor curricula, materials or infrastructure. “Curriculum plans, instructional materials, elegant classrooms and even intelligent administrators cannot overcome the negative effects of weak teaching or match the positive effects of positive teaching. The entire formal and informal curriculum of the school is filtered through the hearts and minds of classroom teachers, making the quality of school learning dependent on the quality of teachers” (Holmes Group, 1986, p.2323 in Kanu, 1996, p.174). This aspect is particularly important in the Mozambican context where, even if the infrastructure is lacking and resources are scarce, teacher competence could ensure the delivery of quality education (Alberto and Mahumane, 2000).

A survey carried out by Châu (1996) noted two things about the teachers surveyed. Firstly, the teachers had no training and as a result tended to use a traditional teaching approach that was teacher-centred and fairly rigid or even authoritarian. Secondly, the teachers surveyed did not have the levels of competence and motivation which were required in implementing progressive methods which favour pupil-centred learning, are based on discovery and consequently on the construction of knowledge by the pupils themselves. Currently, the recommendation is to use

active methods centred on the child, because that is the best way to involve the child in his/her own learning. Participation of the students in their own learning will lead them to achieve the educational goals set by the curriculum. Research, however, has shown that teachers prefer to use expository methods (teacher-centred methods) because a lack of training hinders the teacher in the implementation of active methods and the use of relevant teaching and learning materials.

A further important aspect is for teacher training programmes to demand reflection on values and beliefs about teaching (teaching philosophies) to find out whether these are in accordance with teaching practices. A teacher's attitude, which should be characterised by beliefs, expectations, strong motivation, clarity of exposition, a positive attitude, enthusiasm, interest in the children, availability to help children, intensity of interaction with pupils and structured teaching (organizational ability), needs to be investigated (Châu, 1996). The attitude of the teacher affects the teacher's performance, because even if he or she has high levels of professional training and subject knowledge, if the teacher has a negative attitude the students may not perform optimally.

Myint's (1999) study suggests the need for collaboration between teacher training institutions and schools in improving the quality of initial training, so that prospective teachers are equipped to meet the challenges they will encounter in schools and be prepared to address the needs of society when they become teachers. Shah (1995) suggests that when selecting the objectives and content of teacher education programmes, the principles of "policy goals and aims, characteristics and needs of prospective teachers, the roles expected of teachers and the findings gleaned from evaluation and research studies" should be taken into consideration. Ben-Peretz (1995, p.543) explains that the curricula of teacher education programmes are generally based on four components: subjects matter studies, foundations of education studies, professional studies, and practicum or supervised practice. In rare cases, the curriculum integrates subject matter studies with professional studies such as courses on teaching methods. However, the treatment of subject matter in a way that relates to pedagogic issues may yield more valid and useful knowledge for prospective teachers, with various authors (Shulman, 1986, Grossman, 1995, Medley and Shannon, 1994) considering them the essential components of teacher education curricula. In fact, although subject knowledge is essential for good teacher performance, including it in the training curriculum may overload the programme. The Foundations of Education component of the curriculum usually includes the history, philosophy and sociology of education, but needs to include the study of contemporary issues and educational policy as well as. The Professional studies component usually includes the methods courses, the curriculum courses, and courses based on knowledge generated through research on teaching while Practicum or supervised practice is the most favourably viewed component of teacher education in many countries.

In South Africa, for example, a publication by the Committee on Teacher Education Policy (DoE, 1996) presents the necessary competencies to be developed in teachers during training, arranged under the headings Knowledge, Skills, and Values. General competencies are related to knowledge, which is described as subject content, national, regional, and school curriculum policies, curriculum theory, the role of parents in the education process, the organized teaching profession, culture, religion and the community, and so forth. Competencies related to (classroom) skills include communication, methodology, classroom management and assessment; and values/attitudes/dispositions are values related to the school and attitudes related to professionalism.

A number of researchers (Shulman, 1986, Westera, 2001, and Medley and Shannon, 1994) have proposed frameworks for the domains of knowledge which inform teacher training. Grossman's (1995, p.20) framework includes six domains: knowledge of content, knowledge of learners and learning, knowledge of general pedagogy, knowledge of the curriculum, and knowledge of the context, but knowledge of self is another important aspect to consider in teacher training.

Investing in human capital is the best way to improve the quality of education, and is the key to increasing the quality of achieving the education outcomes which is confirmed by Steyn (1999), who states that the efforts towards improvement of schools should focus on people improvement. He further states that investing in human capital is the key to effective improvement of the quality of schools. Programmes and materials do not bring about effective improvement, but the people in the education system do (Steyn, 1999). For instance, in Ministry of Education the results arising from a project supported by UNICEF and carried out in Gaza province in Mozambique (MINED, 1980) showed that improving school conditions without improving teacher training does not improve the quality of education. It was the evaluation of this project that informed the revision of the Mozambican teaching training programme.

3.4 COMPETENCE RELATED TO TEACHER EFFECTIVENESS

When thinking about competences, concepts such as performance and effectiveness are involved because competence is directly linked with effective performance in complex situations as it is thought to serve as a causal factor for success because “competent performance presumes competence” (Westera, 2001). Thus, three conceptual dimensions of teacher quality that are commonly used in making judgements about teacher's work, include teacher competence, teacher performance and teacher effectiveness. The first two dimensions have been discussed but teacher effectiveness refers to the results a teacher gets or to the amount of progress the pupils make toward some specified goal of education is defined in terms of what the pupils do (Medley, 1982,

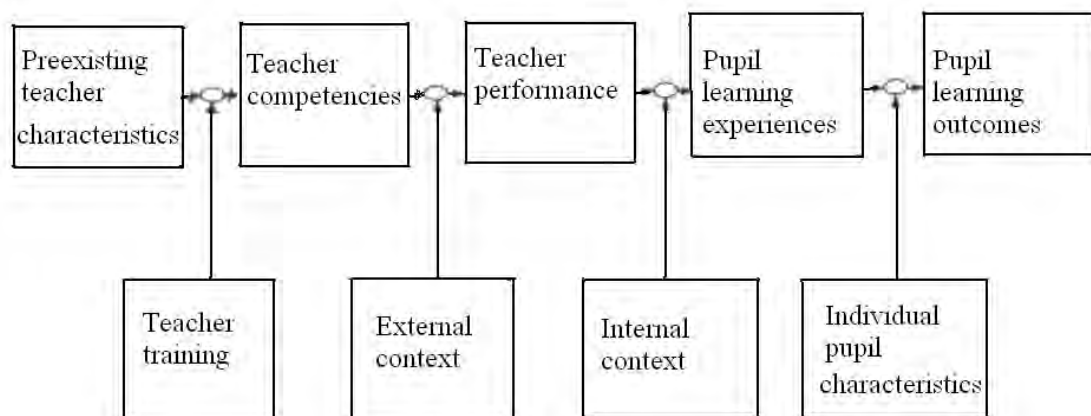
p.1894). There is a relationship between teacher competence and teacher effectiveness which determines teacher influence in pupil progress towards defined educational goals.

Effective teachers are those who achieve the goals they set for themselves or the goals set for them by others such as school principals, education administrators and parents (Anderson, 1991). Cheng and Tsui (1996) agree that understanding teacher effectiveness must be based on understanding the relationship between teacher competence, teacher performance and the set goals or expected educational outcomes. Effective teachers can thus be understood as those who possess relevant competence and use the competence appropriately to achieve their objectives (Cheng and Tsui, 1996).

Medley (1982) explains that the “structure of teacher effectiveness is a very comprehensive framework, which can integrate the teacher trait perspective, the teacher behaviour perspective and the process-product of teaching perspective to explain the relationships between teacher competence, student learning experience and educational outcomes” (1982, p.12). Medley’s model will be discussed in the next subsection and then the Cheng and Tsui models.

3.4.1 Medley’s Model of Teacher Effectiveness

Medley (1982, p.1899) proposes that the structure of teacher effectiveness should include nine important components as illustrated in Figure 3.4 below:



Source: Medley, 1982, p.1899

Figure 3.4 Medley’s structure of teacher effectiveness

The five cells in the top row (on-line) define five types of variables, each of which has been used at one time or another as a criterion for evaluating the teacher. The four cells in the second row (off-line) define additional variables that affect the outcomes of teaching not controlled by the teacher. The arrows in the diagram indicate the flow of influence from one variable to the next. Each cell is joined by an arrow to the cell that it influences most directly (Medley, 1982).

Pre-existing teacher characteristics designates knowledge, abilities and beliefs that the teacher is expected to possess on entering into professional training. For the most part, these characteristics are stable personality traits (like general intelligence or interest in children) that are believed to be relevant to successful teacher performance but that a teacher education programme cannot and should not try to develop in students who do not already possess them (Medley, 1982, p.1895).

Teacher Competence refers to the knowledge, abilities, and beliefs a teacher possesses and brings to the teaching situation. These attributes constitute a stable characteristic of the teacher that does not change appreciably when the teacher moves from one situation to another (Medley, 1982, p.1894).

Teacher Performance refers to the behaviour of a teacher while teaching a class (both inside and outside the classroom). It is defined in terms of what the teacher does (Medley, 1982, p.1894).

Pupils' learning experiences refers to the behaviour of pupils while teaching is going on. This factor is not a teacher characteristic, but it has a great deal to do with how effective the teacher is, since the amount a pupil learns depends on what the pupil does (what experiences he or she has). Any effect the teacher has on pupil learning must result from some effect the teacher has on the pupil's learning experiences (Medley, 1982, p.1894).

Pupil learning outcome is a direct result of pupils' learning experiences. Learning is, after all, something that pupils do, which a teacher facilitates by providing opportunities. When a teacher "teaches," what he or she really does is to try to provide certain learning experiences or opportunities for the pupils who are expected to develop the desired learning outcomes (Medley, 1982, p.1898).

Teacher training reflects the efforts of teacher educators or others to help a teacher to grow in competence - that is, to add additional competencies to his or her repertoire. The set of competencies a teacher has at the end of pre-service preparation is a mixture of pre-existing teacher characteristics and knowledge, abilities, and beliefs acquired during training (Medley, 1982, p.1899).

The **External teaching context** is the set of characteristics of the school in which the teachers works. The external context interacts with the competencies the teacher possesses to determine how well that teacher performs in that particular situation. The physical and support facilities in the school, the media and materials available to the teacher, and the relationship between the school and community are variables that belong in this cell (Medley, 1982, p.1900).

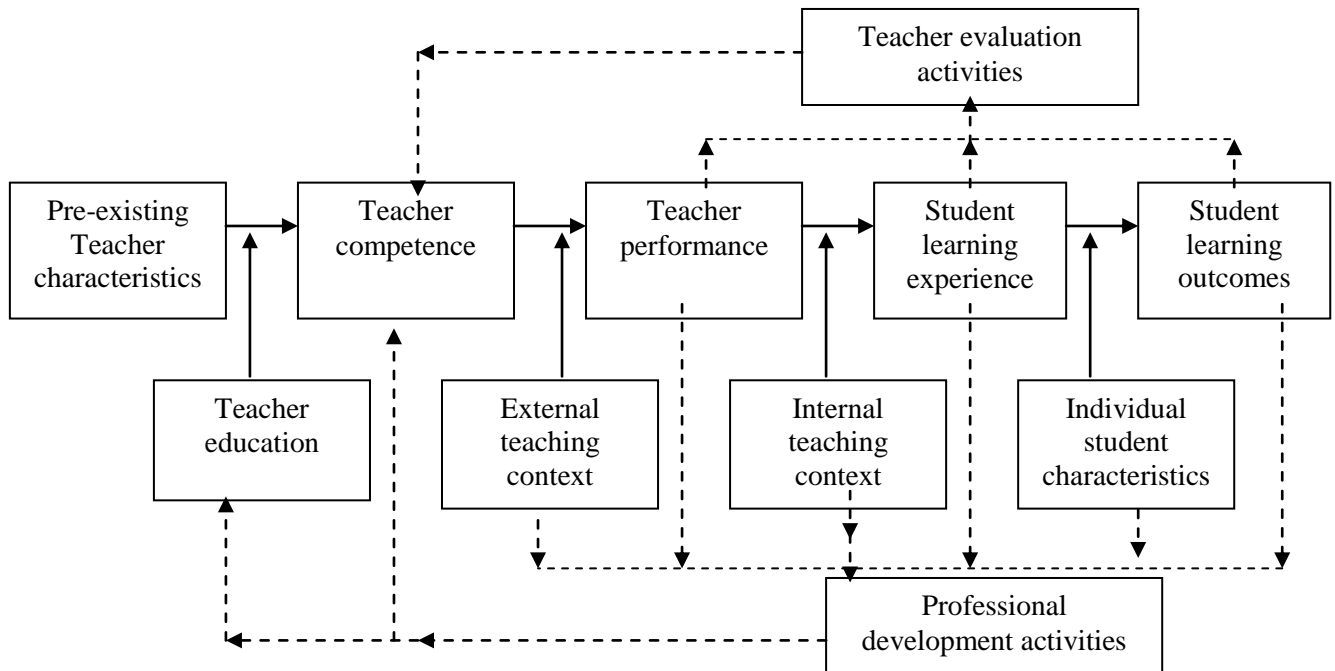
The **Internal teaching context** is the set of characteristics of the class taught by the teacher as a group. The internal context interacts with teacher performance in determining the learning experience pupils have in that classroom. Such variable as the class size, the average ability, heterogeneity, the ethnic composition and socio-metric properties (profiles) belong in this cell (Medley, 1982, p.1900).

Individual pupil characteristics are the characteristics of individual pupils that determine what learning outcomes result from any particular learning experience that a pupil might have. Two pupils will be affected differently by identical learning experiences because they differ in ability, interests, values, background and so on (Medley, 1982, pp.1984-1900).

In Medley's model as illustrated in Figure 3.4, the central issue of teacher competence is shown as emanating from inter-related components of teacher training, teacher characteristics, and teachers' performance, which ultimately has an effect on pupil outcomes. The model indicates that the quality of the teacher depends not only on the quality of training but also on the teacher's background or the teacher's pre-existing characteristics. The pupil's learning experience is influenced by the teacher's performance and the internal teaching context. Finally, pupil learning outcomes are a result of pupil learning experiences and individual pupil characteristics. Therefore, when discussing pupil outcomes it is necessary to take into consideration all of the components that affect pupil performance.

3.4.2 Cheng and Tsui's Models of Levels of Teacher Effectiveness

Two significant models built on Medley's work were developed to illustrate teacher effectiveness. In the first model Cheng and Tsui (1996) developed Medley's structure through the inclusion of two more components, namely teacher evaluation and professional development (in Cheng and Tsui, 1996, p.8), as shown in Figure 3.5 below:



Adapted from Medley: Source: Cheng and Tsui, 1996, p.9

Figure 3.5 Teacher evaluation and professional development

Based on the structure above, Cheng suggested three different strategies for improving teacher effectiveness, the short-term, long-term and dynamic strategies.

The short-term strategy is the traditional, most commonly used strategy for improving teacher effectiveness. It focuses on changing overt teacher performance (mainly in terms of teaching behaviours) to adapt to the teaching context. Short-term training is used to correct teacher weaknesses and undesirable behaviours. However, the strategy is based on three assumptions. Firstly, it assumes that teaching context is something “given” and not alterable, and that in order to achieve high quality student learning outcomes teachers must accommodate or adjust their behaviour to the internal teaching context. Secondly, it assumes that teacher behaviour in classrooms must be altered or changed if unsatisfactory student learning experiences and outcomes are identified. Thirdly, it assumes that some straightforward prescriptions such as standard teaching behaviours and methods can readily be used by all teachers. Curriculum planners and teacher trainers often develop and introduce a greater number of standard teaching behaviours to school teachers (in Cheng and Tsui, 1996).

Using a short-term strategy, the teacher becomes an implementer, but the role of teacher is passive and is externally managed. Because this view ignores the importance of teacher competence for

teacher performance in the classroom, it may not successfully induce any long-term and systematic improvement in teacher effectiveness. Without development in teacher competence, persistent and effective change in teaching behaviour is almost impossible (in Cheng and Tsui, 1996).

The long-term strategy focuses on strengthening teacher competence so that teachers can have sufficient professional knowledge, techniques and confidence to develop their own teaching styles, to adapt to the external and internal teaching contexts, and to perform effectively in the classroom. Strengthening teacher competence is a continuous, long-term process involving systematic learning and reflection. Through summative, formative and diagnostic teacher evaluation, teachers may learn continuously and develop repertoires of professional competence which can be used to adapt to different teaching contexts and carry out teaching tasks effectively. Through systematic professional development teachers can grow and develop to acquire new knowledge, skills and attitudes which in turn promote or improve their teaching performance at different stages of their careers (in Cheng and Tsui, 1996).

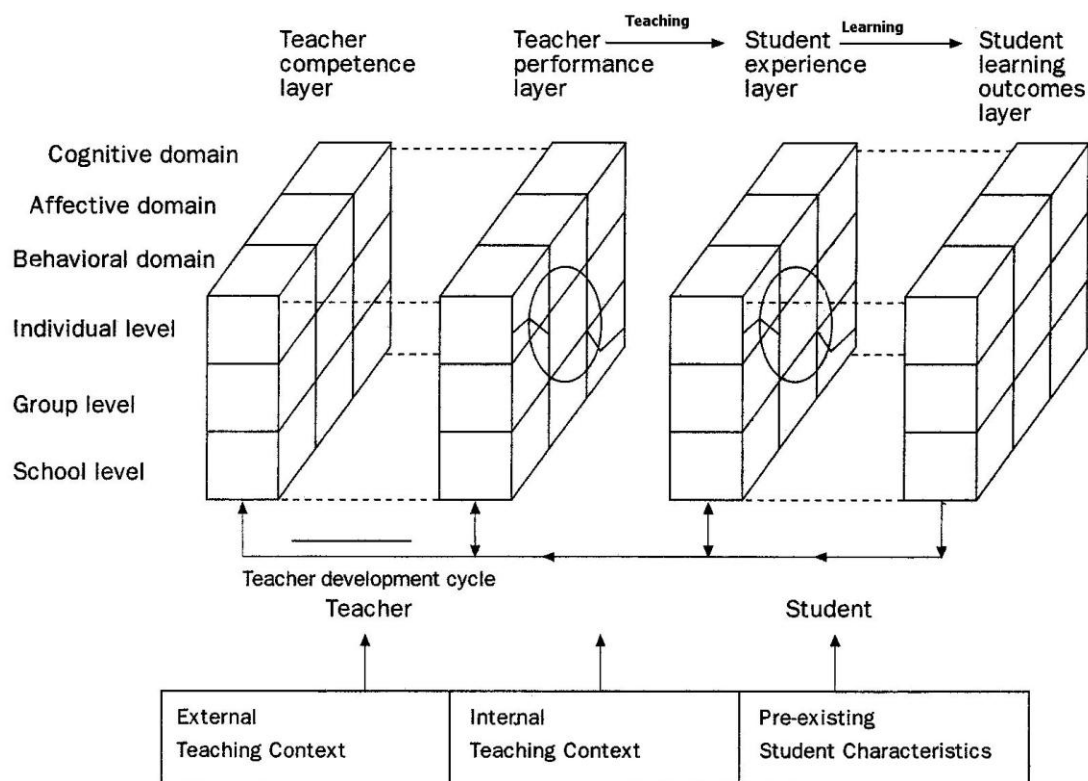
Cheng (in Cheng and Tsui, 1996) suggests that this long-term strategy is far better than the short-term strategy because it may have long-term systematic and internalised effects on teacher competence and performance. However, this strategy still has limitations because it assumes that the external and internal contexts of teaching are “givens” and are static. The implication is that the role of the teacher is passive and partially managed, and does not expect teachers to take an active role in changing the external and internal teaching context in order to create an improved environment for teaching and learning. As teacher effectiveness may in certain cases not be maximized, the dynamic strategy was proposed.

The dynamic strategy assumes that most of the components associated with the structure of teacher effectiveness can be altered. In order to maximize teacher effectiveness, both the teacher’s competence and performance and the teaching contexts should be changed. Teachers should not only adapt to the teaching contexts, but also adopt the role of change agents. This strategy aims at empowering teachers as educational leaders and professional implementers so that they can play an active role in improving both the external and internal teaching contexts and maximise their effectiveness at both organizational level and classroom level (in Cheng and Tsui, 1996).

Cheng (in Cheng and Tsui, 1996) argues that the activities of professional development and teacher evaluation should be further developed and strengthened to help teachers not only to gain knowledge and develop skills and attitudes but also to develop critical minds, entailing the ability to engage in self-reflection and management of their practice. Following this line of thinking, the concept of teacher effectiveness should therefore not be confined just to teacher behaviour or

performance in the classroom, but should be extended to incorporate organizational aspects such as the teacher’s involvement in educational reforms. Improving teacher effectiveness should be a long-term and dynamic process involving not only the teachers’ professional growth but also the schools’ continuous change and development. The effects of this strategy on teachers and schools are long-term and systematic, and can be internalised and institutionalised.

Cheng (in Cheng and Tsui, 1996) prefers the dynamic strategy, but all of the strategies have limitations because they ignore the complexity of teacher effectiveness and narrow the concept to the individual teacher, particularly in a classroom context. Taking into consideration the limitations of the traditional concepts, Cheng and Tsui (1996) developed a new conceptual framework introducing a third dimension of “total teacher effectiveness” whereby the “total quality” of the teacher competence layer contributes to the “total quality” of the teacher performance layer and the latter contributes to the “total quality” of the student learning experience layer and then to the quality of the student learning outcomes layer.



Source: Cheng and Tsui, 1998, p.41

Figure 3.6 Levels of teacher effectiveness

As seen in Figure 3.6, Cheng and Tsui’s (1998) model consists of the following layers:

Student learning outcomes, which are the product of the interaction between students' learning experience and individual characteristics.

Student learning experience, which is affected by both teacher performance and the internal teaching context.

Teacher performance, which is determined by the interaction between teacher competence and the external teaching context.

Teacher training and pre-existing teacher characteristics, which can contribute to teacher competence.

Teacher evaluation, which is composed of activities based on information from teacher performance and student learning experience outcomes, and can facilitate the development of teacher competence.

Professional development activities, which are supported by the characteristics of the external and internal teaching contexts, teacher performance, students' individual characteristics, their learning experience and learning outcomes and thus can contribute to the development of teacher competence and teacher education (Cheng and Tsui, 1996, p.8).

The conceptual framework defined by Cheng and Tsui (1998) comprises three dimensions comprising the three domains: cognitive, affective and behavioural - three levels: individual, group and school - four layers: teacher competence, teacher performance, student experience and performance and other related components of teacher effectiveness, such as the external teaching context and the internal teaching context. The model also illustrates the relationship between all of these elements. However, teacher education and teacher characteristics, which are very important components of teacher effectiveness, which are omitted from Cheng and Tsui's (1998) model, should be explicit in the conceptual framework model. These two components were part of the previous model adopted by Cheng and Tsui and there is no explanation why they were excluded from the 1998 model. The teacher development cycle included by Cheng and Tsui (1998) cannot be completed without taking into consideration the teacher's characteristics and teacher training. In the conceptual framework of total effectiveness, the relationship between these components is not clear. The two complement each other, since Figure 3.5 establishes a clear relationship with all components and Figure 3.6 establishes the levels and layers.

The discussion of the many models presented in this section has assisted in developing a framework which could be considered for understanding the importance of teacher training in developing teacher competence for successful teaching and learning in schools, and thus improving the performance of students. In the Mozambican context, it is crucial to see these three aspects as inter-related, as the one impacts on the other. Effective teacher training is vital in enhancing successful teaching and learning in schools.

3.5 ASSESSMENT OF TEACHER COMPETENCE

“The teacher is the key player on the educational stage and we often expect him or her to make up for the deficiencies in the curriculum and in educational resources. The success of the educational enterprise is therefore believed to hinge on the quality of teaching that goes on in the classrooms” (Howie and Plomp, 2005, p.53). This claim means that from a professional point of view the competence of a teacher is important, as successful teaching and learning depends on it. But evaluating or assessing a teacher’s competence (performance and effectiveness) is a difficult process as this evaluation is dependent on student performance and, as in any evaluation, it is very difficult to distinguish between different levels of competence and skills.

Medley and Shannon (1994) observed that a test to measure teacher competence should include not only content knowledge of the subject matter the teacher is expected to teach, but also general knowledge of the kind that any educated adult is expected to possess. The term “teacher effectiveness” will be used to refer to the results a teacher obtains or the extent of progress the pupils make toward some specified goals of education. One implication of this definition is that teacher effectiveness must be defined, and can be assessed only in terms of the behaviours of pupils, not the behaviours of teachers. For this reason, and because the extent to which pupils learn is strongly affected by factors not under the teacher’s control, teacher effectiveness will be regarded not as a stable characteristic of teachers as individuals but as a product of the interaction between certain teacher characteristics and other factors that vary according to the situation in which the teacher works.

According to Popham (1997), the teacher and the school are evaluated according to the learning and achievement “outputs” of their students. In addition, the measurement of teacher competence in terms of pupils’ performance is often difficult because many variables are involved. Simply put, most efforts to connect student achievement to individual teacher performance have floundered in the past on the basis of the following weaknesses:

- ❖ The measurement does not take into account teaching context as a performance variable;
- ❖ The measurement is unreliable, in part because it does not include time as a variable – both the teacher’s time with a cohort of students and some model or models of sufficient time to see learning effectiveness in students;
- ❖ The measurements used to reflect student achievement are not congruent with best practice and the philosophy of instruction in modern education (Stufflebeam, 2003, p.610).

As Medley and Shannon (in Dunkin, 1997) pointed out, the main tools used in assessing teacher competence are paper-and-pencil tests of knowledge. Indeed, the main tools for assessing teacher performance are observational schedules and rating scales and the main tools for assessing teacher effectiveness are data collection about the teacher’s influence on the progress that the student makes towards defined educational goals; and these data are most likely to be student achievement tests.

Consequently, a teacher’s performance and the students’ achievement are inextricably linked. This linkage is a compelling argument for ensuring that how students perform on some array of assessments becomes an important part of a teacher’s performance evaluation (Stufflebeam, 2003). However, a critical part of the evidence for the link between student tests and teacher performance needs to be the teachers’ knowledge and awareness of the testing methodologies and test content, and the interface between those methodologies and the content and curriculum that guides their instructional practices (Stufflebeam, 2003).

In the past decade, considerable progress has been made towards developing a framework for teaching and learning in three main areas: what student testing can and should do as a part of the instructional system; what teachers should know and be able to do and how to incorporate those values and standards into the preparation programme for training teacher; and the links between teacher performance and student achievement. In addition, innovative evaluation strategies for both beginning and in-service teachers have been implemented in several states in the United States. Many of those evaluation strategies combine the assessment of teacher performance with the development and enhancement of teaching skill (Stufflebeam, 2003).

Student testing is an increasingly important part of any consideration of teacher evaluation practices, given the current political and policy climate. How teachers are prepared for their professional work and how they should be prepared to do that work well is the foundation for any evaluation system for professional performance. Clearly, with the emphasis on links between

teacher performance and student achievement, the preparation of teachers for their instructional and motivational roles is essential. And the growing body of evidence about the links between teacher performance and student achievement must be an influential element in the evaluation of teachers' work and the provision of support for their ongoing learning to improve that work (Stufflebeam, 2003).

Exactly how to attribute any student's achievement in any particular year to the current teacher, how to control for variables far outside a teacher's control but profoundly important in affecting students' achievement, and how to create and use really sound and valid assessment instruments are some of the challenges in gathering the evidence to support the argument. And these challenges have proved sufficiently daunting, as the links between teachers' work in the classroom and students' scores on assessment have never really been shown to be systematic in the U.S.A. (Pearlman and Tannenbaun, 2000), which means that in the Mozambican context teacher evaluation is even more challenging. If one evaluates a teacher based on the pupils' outcomes then the lack of infrastructure, the lack of school resources and the poor conditions that prevail in Mozambican schools have to be taken into consideration, as well as the internal (e.g. books, time in the class, class resources) and external teaching contexts (e.g. the school building, the library, the school's equipment) as these have a huge impact on teaching and learning.

The assessment of competences must include the issue of transfer, but assessment is a highly complex process. For instance, competence as a cognitive 'ability' may be determined by the observation of successful performance, but the successful performance may easily be the result of chance, and cognitive malfunctioning could thus be obscured.

To some extent, this assessment also seems to hold for cognitive skills. However, when assessing cognitive skills the focus on outcomes is supplemented with a focus on cognitive procedures or processes that refer to the conditions for success which seems to be impossible to achieve because the concept of 'competence' has a poor theoretical basis. Therefore, using Aristotelian logic (the *modus tollens*, i.e. denying the consequent), it is likely that incompetence can be determined, but not competence (Pearlman and Tannenbaun, 2000).

Barnett (1994) stressed that the capacity to cope with profound societal, international and ecological change cannot be covered by any concept of standardized competence. In this view, no competences can be identified that will carry us forward in a changing world because no competences will carry the value tomorrow that they have today. Competence may be stable but become worthless in a changing world.

Performance in new situations may even become “less competent” because of retention problems, the problematic transfer of acquired competences, or even because of gratuitous but inappropriate transfer. Clearly, the assessment of competences requires the perspective of time, and in this regard, we need to note again the lack of valid assessment standards appropriate to complex situations. As a result, when assessing teacher competence or performance it is vital to take into consideration some important variables such as the quality of parental support, the nature of the relationship with the community, what teachers expect of their pupils, and the quality of the school leadership.

Parental support in education is vital, as compelling evidence has shown that family involvement has a positive effect on learners’ academic achievement. The family plays a major role as a socializing agent by supporting the individuals as they grow from childhood to adulthood. This role cannot be adequately replaced by any other institution. However, parents need to be informed about various and more effective ways of creating or developing learning opportunities and stimulating experiences for their children through their involvement in parenting programmes (Wyk, 2001). Community involvement in school activities has a positive effect on pupil performance. Fullan (2001) stresses that parents and the wider community have largely untapped expertise essential to the partnership. However well or badly parents do, they are the first educators. As part of community, schools need to develop an ‘invitational’ attitude towards parents and to do more to help parents assist their children. Dustmann, Rajah and Soest (1998) support Fullan’s position about the impact parents and the community have on pupils’ performance.

While far from being the sole goal of education, learning achievement is one of the most important outcomes of education, both for individuals and for society. But students are motivated to achieve not only through self-motivation but also through the involvement of their peers, their parents, their teachers, and their communities. This complexity of participation presents a strong challenge to researchers attempting to assess and improve on motivational techniques that would maximize the learning opportunities for pupils (Fuhrman, 1991). Incentives for students to achieve include not just direct incentives for the pupils but also incentives affecting all those who influence the pupils’ learning performance (Windham, 1997).

Teacher expectation is another important variable, as research has shown that because teachers have not expected very much from them, many students have not learnt very much. It is therefore important to motivate and encourage youngsters and require them to master a body of knowledge and skills that they will need if they are going to succeed in the new world order. If standards are not raised, reform will have no purpose, particularly as students will move out into a world of determined, well-educated competitors (Murphy, 1993, p.642).

Leadership is a further variable, as the literature on school improvement emphasizes a variety of ways in which principals may affect school improvement. Some authors have identified the links between leaders and academic achievement. The outcomes-based evaluation of principals has assumed both a direct (explicit) and indirect (implicit) linkage between principals and the levels of student achievement (Glasman and Heck, 2003).

Finally, despite the importance of all the variables mentioned, the factor that contributes most significantly to effective teaching and learning is the quality of teacher training, with special emphasis on the training and its management, particularly in developing countries where a range of teacher training models have been implemented over the years.

3.6 THE RELATIONSHIP BETWEEN TEACHER COMPETENCE AND PUPIL PERFORMANCE

The problem of teacher competence is not related only to the level of teacher instruction but also to the level and quality of training. Both the academic level achieved and the quality of the professional training received, contribute to the competence of a teacher. Researchers such as Kanu (1996), Châu (1996), Myint (1999) and Darling-Hammond (1999) refer to teacher competence when they stress that the quality of education depends on the quality of the teacher. Researching teacher competence can be done from a variety of perspectives. According to Warham (1993), the positivist view of the scientific teacher suggests that only research generated from academic sources is relevant to assessing teacher competence. The hermeneutic view suggests that only knowledge generated within the classroom is relevant to assessing teacher competence. However, Warham (1993) points out that the middle view of the critically reflective teacher attempts to overcome these difficulties by accepting that knowledge generated from both inside and outside the classroom is important for assessing teacher competence.

Châu (1996) maintains that the teacher's level of competence is one of the factors that directly affect the quality of teaching. One might think a priori that there should not be major problems in this regard at the primary level, given that most teachers in the countries studied have a reasonable level of education (10 to 12 years of school). But the formal level of education is not necessarily synonymous with competence. Classroom observations in the different countries show that certain teachers have an insufficient mastery of the subject matter they teach. In addition, many of them lack the pedagogical know-how required for good presentation of the material (Shulman, 1986). Insufficient mastery of subject matter was particularly true in Madhya Pradesh, India, where the findings revealed that most teachers had not received any specific professional training, which had

an effect on the teaching and learning and thus on pupil performance. And similar problems have also been identified in other countries (Châu, 1996, p.186).

Researchers such as Steyn (1999) and Dimmock (1990) confirm the important role of teacher competence in ensuring the quality of pupil performances when they say: “Seventh grade pupils tended to perform better on high level thinking tasks when the teachers teaching them had advanced certification in mathematics” (Howie, 2002, p.49). According to Botha and Hite (2000), a competent teacher will focus on certain predetermined results or outcomes which are to be achieved by the end of each learning process. Therefore, the use of student achievement as a gauge of teaching effectiveness is reasonable and appropriate and one could say that students’ learning is the most important criterion by which to evaluate teachers.

Links between student achievement and teacher effectiveness, and the measurement or assessment methodologies used to track such links, are increasingly considered as “connected accountability” in order to assess performance in teacher evaluation systems (Pearlman and Tannenbaun, 2003, p.617). In addition, there is much more insistence on the necessary connection between teacher performance evaluation and students’ achievement, but no more clarity about how such a connection can be credibly and validly made (Ibid, 2003).

Improving teaching practice by improving teachers’ knowledge is essential if the quality of education and most particularly primary education in the developing world is to improve. This assertion is not intended to diminish the importance of investments aimed at improving facilities, developing coherent curricula, providing cost-effective instructional materials, textbooks, or technology, or improving school management. But the impact of each of these investments on student learning depends upon the capacity of teachers to utilize resources effectively in classrooms (Raudenbush et al., 1993).

From the review of the literature, one can conclude that the concept of competence is complex and that there are many factors which contribute to teacher competence. However, two important aspects, which should be considered in developing teacher competence in teacher training programmes, have not been addressed. There seems to be a lack of literature which looks at the competence of the trainers in the teacher training institutions and secondly, there is lack of literature about the importance of the availability and quality of the staff of annexe schools used for practicum or supervised practice, which is regarded as a vital aspect of teacher training (Ben-Peretz, 1994).

In the next section, the relationship between teacher competence and pupil performance will be highlighted with an examination of cross-national studies conducted by a number of organisations on the topic of the performance of pupils in reading and mathematics.

3.7 PUPIL PERFORMANCE IN READING AND MATHEMATICS IN CROSS-NATIONAL STUDIES

Primary education is recognized as a basic human right, vital to the development of individuals and societies. One of the goals of primary education is to help children to acquire and develop reading skills as “It is the foundation for learning across all subjects (Mullis, Kennedy, Martin and Sainsbury, 2004). The development of reading skills is a constructive and interactive process. However, if this is not accomplished, the lack of and/or poor reading skills can have an effect on pupil performance.

3.7.1 The Acquisition of Reading Skills

The acquisition of reading skills is the goal for primary education and thus it is the foundation for all further learning. Reading also plays an important role in making a success of education and in the citizens’ lives. However, in the SACMEQ countries the study of pupils’ performance has revealed problems which are thought to be related to literacy, and so it becomes important to discuss factors related to the acquisition and development of reading skills.

In the process of reflecting on the acquisition of reading skills it is imperative consider two important matters: firstly, the acquisition of the prerequisites making it possible for pupils to learn to read, and secondly, the quality of the teachers and the level of their knowledge of the methodology of teaching reading skills.

There are three abilities, which are prerequisite to the acquisition of reading skills, namely the speaking, reading and writing abilities:

Speaking abilities include knowledge of the body, the development of orientation in space and time, the development of auditory perception; the development of the attention span and auditory memory, the development of visual perception; the development of the other senses; vocabulary enrichment and the development of the ability to generate sentences.

Reading abilities include the development of special visual abilities, the development of special orientation to graphic symbols, lateral dominance, the development of auditory discrimination and memory, the development of comprehension abilities, and mastery of the concept of maintenance.

Writing abilities refer to the development of visual-motor coordination, the development of fine and discriminatory motor coordination, and the development of kinaesthetic memory (Passos, 1995, adapted from pp.19-24).

The study carried out by Passos (1995) in first grade pointed out that a pupil who had attended preschool or kindergarten would perform better in the acquisition of reading skills than one who had not. For instance, in Mozambique a study carried out in the first grade to evaluate the level of acquisition of prerequisites during the school years showed that “among the four variables (age, sex, mother tongue and attendance of kindergarten) attendance of kindergarten is the one which registers the most significant differences in every test (ABC and Reversal)” (Passos, 1995, p.78).

The study carried out by the World Bank (2006) found that the average reading achievement was weakest among students who had not attended preschool. Internationally, the average achievement was also the lowest among students that had not attended preschool (491 points), and the highest average achievement for those who had attended preschool for more than two years was 523 points. Poor reading skills in early grades (slow speed and poor fluency) are hypothesized to be behind much of the poor performance that appears in achievement tests later on, as well being linked with early dropout and repetition, particularly among the poor (Abadzi, 2005, in the World Bank, 2006, p.35).

The results of the two studies, Passos (1995) and (2006), stress the importance of the acquisition of the prerequisites for reading and writing and the role that they play in the effective learning to read. For instance, it is not possible for pupils to distinguish the difference between the symbols of the alphabet or the difference between their sounds if they are not able to recognise the difference or similarity between objects or to recognise the different sounds created from different objects, just to mention some examples. The acquisition and teaching of reading skills is a very difficult task for pupils and teachers, but the inability of children to attend preschool makes it very hard for a teacher to teach and for pupils to learn reading skills.

3.7.2 Methods of Teaching Reading Skills

Besides the importance of the prerequisites and the role that they play in the acquisition of reading skills, it is crucial to take into consideration the methods used to teach reading. The following are

important to recognise in this regard: the level of knowledge (the dominion) that the teacher possess about the methods and the implementation of the methods in the textbook. The methodology should take into consideration whether the language of instruction is the first or second language for the majority of the pupils, and then define the strategies appropriate to teaching reading skills. It necessary to ensure that the methodology used in the textbook is appropriate for application in the classroom. All of these aspects play an important role in facilitating the acquisition of reading skills. It is essential to stress that when pupils do not speak the language of instruction, the method selected should be appropriate to second language instruction, which means that the pupils should first acquire the language and then learn to read it. When pupils already speak the language of instruction, this ability forms a foundation upon which to develop further oral, reading and writing skills.

The speed with which pupils read in the first grade is directly related to the method used as a starting point to acquire reading skills. For example, one method is introducing the pupils to phonics and the alphabet. With this method, pupils have a tendency to spell out the words and not read full sentences. The other methodology is introducing the pupils to words or sentences, and in this case, the tendency of pupils is to read the sentence with fluency and comprehension, which means that they tend to read at a better pace and acquire and develop reading skills faster than those whose starting point is phonics or the alphabet. Research has shown that there are advantages and disadvantages to both methods. It is therefore important to take into consideration the most appropriate methods for the context.

In Mozambique, the method of teaching reading skills is defined by the Ministry of Education and Culture and it is compulsory for classroom practice. Teachers cannot choose the method that they want to use, and the textbooks prescribe the ways in which teachers must apply the method. The extent of the success of the teaching of reading skills therefore depends on how deep the teachers' mastery of the method is and how they implement it in their classrooms.

Sometimes in-service training is indicated as a way in which to provide training which might impact on the achievement of results. In Peru, "the school buildings were upgraded, there was an improvement in the support materials distributed, and substantial in-service training was provided. Nevertheless, the school system showed no signs of improved teaching and learning. It was alleged that this lack of improved teaching and learning was as a result of a lack of incentives to motivate teachers, falling teacher salaries (low morale), and almost no supervision or teacher accountability" (World Bank, 2006, p.36). Perhaps it could have been differently concluded that there was little understanding of content knowledge and of the methodology needed to teach the various subjects?

Often teachers are trained to use active methodology, but lower primary teachers need to be given specific methods to teach reading and other subjects. A possible reason for the failure of in-service training is because the modules or the programmes of training are not based on a diagnosis identifying particular needs to be addressed by the training, with a focus on specific methods and practice lessons in primary schools. Demonstration lessons in schools show how theory is to be implemented. They lead to better comprehension by the teachers and therefore to a change in their attitudes to their task.

In 2000, the evaluation of Ligacao Escola Comunidade (LEC) (the community school link) project carried out from 1996 to 1999 in Nampula province in Mozambique, showed that the approach used in the project had been well received by the teachers (Alberto and Mahumane, 2000). The researchers had first conducted a diagnosis to identify the main problems teachers in the region were facing in their daily school life, and then focused on specific methods of dealing with them. The training started with theoretical lessons, which were followed by simulations, and finally by practice lessons in primary schools. This approach, according to the teachers, was helpful. For instance, 79% of the teachers said that the approach allowed them better assimilation of the content. Then, 83% of teachers they said the approach allowed them to learn new teaching strategies and to change their attitudes, 86% of the teachers said the in-service training improved their performance, 79% of the teachers said that the approach improved their pupils' performance, while 77% of the teachers said that the approach improved pupils' achievement (Alberto and Mahumane, 2000, p.16). For 62% of teachers, the practice lessons played an important role in their learning of the methodology and in their qualitative change in terms of performance (Alberto and Mahumane, 2000, and World Bank, 2006). Now, in order to change the attitudes in classrooms and to change the methods used, it is vital to show both in theory and in practice how to teach using the new approach.

3.7.3 Pupil Performance in Reading in Cross-national Studies

In this section, the results of some studies of pupils' performance in reading and mathematics are presented and discussed. According to Chowdhury (1995), reading is a basic skill and plays an important role in citizens' daily lives as well in a country's development. Literacy rates represent the most telling indicator of a country's educational status. Studies show that literacy increases the productivity and earning potential of a population, and improves its quality of life.

Reading skills are also the foundation on which all learning of other subjects is established. The development of reading skills depends on the internal and external efficiency of the school system. Over the years, many cross-national studies were conducted (elaborated on in Chapter 4). One of

them was the Reading Literacy Studies in 1991 (IEA), which involved some countries in Africa, America, Asia and Europe. The IEA carried out a study that involved two age groups, that is 9 and 14 year-old learners. A Rasch scaling method was used to create an international scale which had a mean of 500 and a standard deviation of 100 (Elley, 1992, p.11). The results from different countries showed that generally speaking, there are some problems relating to reading competence, especially in some developing countries. In terms of pupils' performance, it was observed that the difference between most developed countries was not very great, but there were real, stable differences in reading literacy levels between nations. All the developing countries tended to have lower achievement levels than the industrialized nations. In general, their economic position was weaker and they lacked long-standing literacy traditions (Elley, 1992).

In terms of the overall mean, Finland was one of the countries where pupils achieved the highest performance in the two age groups of 9 years old (569, SE 70) and 14 years old (560, SE 65). Pupils in Venezuela had the lowest mean (383, SE 74) for 9 year olds, while pupils in Botswana achieved the lowest mean among pupils of 14 years with 330 (SE 43) (Elley, 1992, pp.14-24). The result of the IEA study showed that Finnish and Swedish students live in rich, well-educated, relatively homogeneous societies with abundant resources and high standards of health. The last three countries (Nigeria, Zimbabwe and Botswana) on the list, however, shared virtually none of these apparently beneficial economic and social conditions. To some extent, literacy levels reflect the economic and cultural advantages of the country as a whole which is illustrated by the fact that Sweden had the highest reading literacy achievement (561) of all of the countries participating in the IEA's Progress in International Reading Literacy Study (PIRLS) 2001, while Belize had the lowest one with (327) (Mullis, Martin, Gonzalez and Kennedy, 2003).

Regardless of their level of development, some countries such as New Zealand and Singapore performed better in IEA than others. New Zealand students achieved high scores in all domains, which were an average of 28 points above the predictions based on their relatively modest socio-economic circumstances. New Zealand reading facilitation methods have subsequently enjoyed a notable international reputation (Elley, 1992, p.16). Despite the fact that the majority of pupils do not speak the school language at home, Singapore achieved well above the international mean of 515 (SE 72) at the age of 9 years and 534 (SE 66) at the age of 14 years. According to Elley (1992), the Singapore case is a challenge to current thinking that says children should learn to read in their mother tongue. Over 70% of the students have, as mother tongue, a language that is different from that of instruction, yet the students scored 521 and 519 in the Narrative and Expository domains respectively. According to Elley (1992), countries that use a language of instruction, that is different from the one that students normally speak at home, could learn from Singapore (Elley, 1992).

The examples of Singapore and Mozambique (see the study described earlier) demonstrate that the issue of whether the acquisition of reading skills takes place in the pupils' first or second language is not the most determining variable. Singaporean pupils performed better (above the international mean) than pupils in some developed countries (such as Germany - 503; 522 and Canada - 500; 522, in 9 year old and 14 year old pupils respectively) where the majority of pupils speak the language of instruction at home and the schools have better resources.

A close analysis of the Singapore experience of the process of teaching the acquisition of reading skills, namely the awareness of the prerequisites, the selection of the method of teaching, and the training of the teachers, may be of value to developing countries. Some SACMEQ countries face serious problems in the teaching of reading as evidenced in pupils performing at Level 3 or below (see Chapter 8, Figure 8.9), and it is thus necessary to discover the reason for pupils' low performance in these countries. As suggested by Elley (1992, p.35) "there are clearly some educational factors which are exerting influence on achievement beyond the economic and cultural indicators." Only when these issues are addressed will pupils' performance improve.

3.7.4 Gender Differences in Reading Performance

Previous international studies of reading have shown that girls tend to surpass boys in most countries and cultures, both in their reading interest (Guthrie and Greaney, 1991 in Elley, 1992) and in their achievement levels in reading (Thorndike, 1973, Downing, 1972 in Elley, 1992).

It was identified in the 2000 PISA study that in "all countries there are small gaps between the performance of boys and girls in reading, in favour of girls. This gap is generally smaller in countries with the highest overall scores. Overall, the Scandinavian countries of Sweden, Finland and Denmark show less segregation on all indicators, while Germany, Greece and Belgium show the most. The UK has below average segregation in terms of all indicators except sex, despite a commonly held but unfounded view that segregation in the UK is among the worst in the world" (Gorard and Smit, 2004, p.15).

Analysis of the results for all countries participating in the PIRLS 2001 also showed that girls had significantly higher achievement than boys, as evidenced by the following:

On average, across countries, significantly more girls than boys reached each quartile of their country's achievement distribution. More specifically, 29 percent of girls compared with 21 percent of boys reached the upper quartile, 55 percent compared

with 45 percent reached the median level, and 79 percent compared with 71 percent reached the lower quartile. By subtraction, it can be determined that fewer boys (8 percent, on average) than girls reach the lowest quartile of achievement, and that 29 percent of boys are below the lowest quartile compared to 21 percent of girls. Statistically significant gender differences favouring girls at each quartile were consistent across countries, with only a few exceptions (Mullis et al., 2003, p.29).

In the IEA study of reading literacy, 9-year-old girls were found to be further ahead of boys (Elley, 1992). Girls read more often than boys, read for enjoyment, and preferred reading about a wider range of topics than the boys. The SACMEQ study (2000) followed the same pattern. In the SACMEQ II study, the girls outperformed the boys in reading. For instance, in terms of the mean, girls scored 505 while boys scored 495, which was below the international mean of 500.

In seven countries, a strong relationship was revealed between the number of books reported in the students' homes and the total amount of learners' voluntary reading across books, magazines, and newspapers (Elley, 1992). According to Elley (1992) the pattern was that the students who read least in their individual spare time had the lowest average scores (Elley, 1992). A number of studies have demonstrated that students who read often tend to read well, which shows that there is a positive correlation between the volume of reading and achievement levels.

A correlation between the volume of reading and achievement levels is evident in the above information. In fact, when pupils read they submit themselves to an exercise of reading and interpretation of what they are reading, and in this way they improve their level of text comprehension and increase the range of their vocabulary and the extent of their general knowledge.

3.7.5 Prerequisites for Acquisition of Mathematical Skills

As with learning to read, there are prerequisites for learning the basics of mathematics, such as the notions of size, quantity, position, distance, direction and course, weight, order and shape. Before pupils start doing mathematical operations they must understand what they are doing and why. The purposes of introducing mathematics in primary education are to help children to develop the ability to think logically, and to provide the foundation for the study of more advanced mathematics in the later grades. The way to achieve this foundation is via the step-by-step construction of mathematical content, by engaging the pupils in a developmentally progressive manner. For example, it is not possible for a pupil to develop the capacity for abstract thought if the pupil cannot already solve concrete problems, or perform division operations if he or she cannot

add. Maybe the difficulties that pupils face in upper primary education are related to inadequate teaching or retention of more basic skills in the first grade. This bad start tends to result in an accumulation of difficulties as the pupil goes from grade to grade.

3.7.5.1 Pupil performance in mathematics in cross-national studies

As with Portuguese, mathematics is a core subject in Mozambique. This status means that pupils cannot pass to the next class if they have marks below 10 (50%). It is therefore vital for teachers to facilitate pupils' acquisition and development of mathematics skills. Cross-national studies, conducted over the years, have revealed high performing and low performing countries as well as the difference in scores between each of these which are sometimes significantly large.

In 1995, the IEA carried out studies in mathematics and science in some countries in Asia, Europe, America, Australia and Africa. The Trends in Mathematics and Science Study (TIMSS) (1995) revealed that pupil performance is high in some Asian countries. For example, Singapore (601) was the top-performing country at seventh grade, followed by Korea (577), Japan (571), and Hong Kong (564). These countries all performed very well, as did Belgium (558) and the Czech Republic (523).

Beaton et al., (1996) explains that “comparisons also can be made across the means and percentiles. For example, average performance in Singapore was comparable to or even exceeded performance at the 95th percentile in the lower-performing countries” (p.24). Lower-performing countries included Greece (440), Colombia (369), and South Africa (348).

In examining all countries participating in TIMSS, the same author stated that there were very large performance differences between the top performing and the bottom performing countries and “differences between the extremes in performance were very [also] large within most countries” (Beaton et al., 1996, p.24).

Another IEA study (1997) showed that Korea (561) was the top-performing country at the lower grades (often the third grade) followed by Singapore (552), Japan (538), and Hong Kong (524). The rest of the countries performed below the international mean (500) and the lowest-performing countries included Portugal (425), Norway (421), Iceland (410), and the Islamic Republic of Iran (378) (Mullis et al., 1997). The difference between the scores of the top-performing Korea (561) and the bottom-performing Islamic Republic (378) was very large.

In the upper grades (often the fourth grade), Singapore (625) was the top-performing country, followed by Korea (611), Japan (597), Hong Kong (587), the Netherlands (577) and Austria (559), and all of these countries performed well above the international mean of 500. Some countries performed below the international mean (500). The lowest-performing countries included Portugal (475), Iceland (474), the Islamic Republic of Iran (429) and Kuwait (400) (Mullis et al., 1997). The difference between the scores of the top-performing Singapore (625) and the bottom-performing Kuwait (400) was again very large. The results show an increase in the mean from the lower to the upper grades.

In the TIMSS 2003 study, Singapore was again ranked first at both fourth and eighth grade on the test.

Some countries showed a significantly higher average achievement compared with their performances in 1995 and 1999, but again others experienced significant score declines. For instance, the Republic of Korea; Hong Kong, China; Latvia; Lithuania; and the United States were among those that improved at Grade 8. Greaney and Kellaghan (2008) explain that in this study “roughly one-third of the students in the highest-performing systems scored at the advanced benchmark level. In sharp contrast, 19 of the lowest-scoring systems recorded 1 percent or fewer students at this benchmark level” (p.109).

The 2003 PISA survey of mathematical literacy was conducted amongst 15 year olds. Donaldson (2005) in the inspection report highlights that Scotland scored significantly above the Organisation for Economic Co-operation and Development (OECD) mean. Only one OECD country had a mean score in this area which was significantly higher than that of Scotland. Donaldson has reiterated that improving pupils’ acquisition and development of mathematics skills should be a key priority in the school systems, as is being done in Scotland (2005). He states that most pupils at all stages in primary school were attaining well in number, money and measurement and their skills in written calculation were well developed. But it seems that if these skills are not practised in a sufficient variety of practical contexts, that development is not continued and weaknesses begin to show in the Secondary Schools (Donaldson, 2005, p.1).

The above information emerging from cross-national studies suggests that there is a need for the lower performing countries to examine the different factors which contribute to reading and mathematics achievement and for each education system to focus on the development of reading and mathematics education in the primary school years to ensure that pupil performance is improved.

3.7.5.2 Gender differences in mathematics in cross-national studies

Girls tend to surpass boys in reading. Mathematics tends to favour boys instead of girls. As pointed out by Beaton et al. (1996) in TIMSS, there was no significant difference in most countries between the average mathematics achievement of Grades seven and eight girls and boys, but the differences in achievement that do exist in some countries tended to favour boys rather than girls. Boys in Japan, Iran, and Korea achieved significantly higher means in mathematics than girls in both grades. The boys in Grade 7 performed better than the girls in Belgium, Switzerland and England (Beaton et al., 1996). In examining the contents of the mathematics tested, it can be observed that performance differed most in measurement, where boys had a higher level of achievement than did girls in a number of countries. Iran was the country where the most significant difference was found in Grade 7 (Beaton et al., 1996).

According to Mullis et al. (1997), in the TIMSS study, in most countries girls and boys had approximately the same average mathematics achievement at both grades. However, the few significant differences in achievement that did exist in some countries favoured boys rather than girls. Boys had significantly higher mathematics achievement than girls in both grades in Korea. Boys also outperformed girls in the fourth grade in Japan and the Netherlands. In the third grade, significant differences were found in Hong Kong, Canada, Iceland, Norway, and Slovenia (Mullis et al., 1997).

In the TIMSS 2003 study overall, gender differences in mathematics achievement were negligible. Girls, however, outperformed boys in some systems, while boys did better in other systems. A high level of parental education was associated with higher achievement scores in virtually all systems. At both fourth and eighth grades in the 2003 study, the number of books in the home correlated significantly with students' mathematics achievement (Greaney and Kellaghan, 2008).

The SACMEQ II study produced the same pattern. Boys obtained a mean of 502, which is higher than the girls' mean of 498.

3.7.6 Factors Influencing Pupil Achievement in Reading and in Mathematics

Factors such as school location, school facilities, teachers' education, qualification and experience, class size and pupils' background, just to give some examples, are identified in cross-national studies as factors to take into consideration as influencing pupil's performance in reading and mathematics.

3.7.7 School Factors

School-level factors have traditionally explained the low percentage of variance in many research projects primarily conducted in developed contexts (Howie, 2002, p.51). Reynolds and Cuttance (1992, as cited in Howie, 2002, p.51) reviewed a number of studies and found only 8% to 15% of variance attributable to school factors. However, in some studies such as UNESCO (2008), the World Bank (2006), Howie (2002) and Chowdhury (1995), many factors related to pupils' performance were found at school level, especially in developing countries.

There are three major problems related to the location of a school: access, infrastructure, and the quality of schooling. The lack of physical access to a school is a major problem in primary education in developing countries. Children often do not go to school because places are not available or the schools are too far away from home (Chowdhury, 1995). School location was found to have a significant effect on pupil performance in mathematics in South Africa. Pupils achieved lower scores in rural schools than in urban schools (Howie, 2002). This finding was confirmed by Zhang (2006), when using the SACMEQ II data archive. UNESCO (2008) refers to the distinction between rural and urban schools as a basic reality in all countries – and a multi-dimensional education issue.

The quality of infrastructure and school resources is also related to pupil performance. The quality of the infrastructure in rural areas is usually poorer than in urban areas, as confirmed by Chowdhury (1995), and the school equipment is especially poor or sometimes totally lacking in rural areas. UNESCO (2008), too, refers to the important effect that the condition of a rural school and the availability and quality of school resources have on pupils' performance. The long distances to and from school and the poor school facilities contribute to weaker performance by the pupils and to the dropout and repetition rate. Some researchers such as Anderson (1991), Abagi and Odipo (1997) and Zhang (2006) confirm the negative effects of the lack of or poor school resources on pupil performance. The quality of the schooling is also an important determinant of participation and retention.

Poor quality teaching, curriculum, instructional materials and school infrastructure can have an adverse effect on student learning (Chowdhury, 1995, p.9). However, pupils living in urban areas tended to perform better than their counterparts living in rural areas. Usually schools in the cities had better buildings, equipment, and better qualified and experienced teachers than those in rural areas. These conditions are associated with the pupils' socio-economic status which is usually higher in towns or urban areas than in rural areas, and contributes to better pupil performance. As confirmed by Elley (1992), a pattern emerged in the study at the 9 year-old level. In a group of

seven countries with predominantly lower national economic indicators, the low performance levels in rural schools became progressively higher as the size of the community increased. As a result, pupil performance is influenced by the context and socio-economic status. In contrast, students in cities were typically more proficient than children from small villages, by half a standard deviation (Elley, 1992). In order to attract teachers to depressed or rural areas, the World Bank has supported the construction of teachers' houses and has offered cash incentives for the recruitment of local people, especially females, as teachers in rural areas (World Bank, 2006) in an attempt to raise the standards in such areas.

In most countries, reading achievement is highest for students in urban schools, lower in suburban settings and even lower in rural schools (Mullis et al., 2003, p.224). According to Elley (1992), these gaps have been reduced in some countries by providing rural library facilities. For instance, the availability of books in places such as the school library or the classroom book corner and the number of books at home, as well as the possibility of borrowing books from the library, are variables that make a difference to pupil performance, as reported by Fuller (1987 in Elley, 1992, p.65): "Surveys of achievement in a number of countries have shown that the number of books available to students is a key factor influencing their level of reading ability." In addition, it has been found that the "book flood" (Elley, 1992) or supply of large numbers of high interest books in schools in six countries had consistently beneficial effects. Good readers require a plentiful supply of books (Elley, 1992). The number of books in the classroom, in a school library and at home, therefore, has a positive impact on pupil performance. Instructional material and technology are also relevant to the development of reading literacy, including the extent of the reading material available to pupils. Even where it is quite difficult for developing countries to provide basic materials for school such as textbooks, blackboards and desks, books are a variable which policymakers can influence. It would therefore be useful to further analyse the situation in the SACMEQ countries to find ways to provide books for pupils at schools.

The studies indicate that schools that have high achievement are better equipped than schools with low achievement. These schools usually have ample space, places for every student in the classroom to sit and write, textbooks for every student, and plenty of reading materials (both in classroom libraries and school libraries), small class sizes, and appropriately designed classrooms (Postlethwaite and Ross, 1992).

Mullis et al. (2004) also describe other factors at school level that directly or indirectly affect the acquisition of reading literacy, such as the school policy and curriculum, which establish the context for the formal reading instruction that children receive from the beginning of formal schooling. They point to the importance of the school environment and resources for developing

reading literacy. The school environment encompasses many factors that affect pupils' learning. The sense of security that comes from having few behaviour problems and little or no crime promotes a stable learning environment. The school environment is also enhanced when staff members show positive attitudes towards pupils and collaborate in curricular and extracurricular activities that foster learning. School resources include resources as basic as trained teachers or adequate classrooms and space, as well as less essential but beneficial resources like comfortable furniture and surroundings.

Mullis et al. (2004) also consider other factors that “are likely to have a more direct impact on pupils' reading development than school environment. The instructional approaches and material used are clearly important to establishing teaching and learning patterns in the classroom, including the curriculum, the strategies employed to teach it, and the availability of books, technology, and other resources” (p.32).

The classroom environment and structure may have a significant influence on reading literacy development. The classroom can vary greatly, from a highly structured and teacher-centred space to a more open and student-centred space. The UNESCO (2008) study states that in some countries, pupil-centred approaches were positively associated with more experienced teachers and with pupils with more social advantage, but overall the teachers with more classroom resources practised more pupil-centred activities. In contrast, Mingat (in Verspoor, 2003) suggests that the results of studies (tests or national exams) are significantly affected by the characteristics of the classroom. It is what goes on in the classroom that counts more than the physical environment in which the educational services are provided.

The learning environment and the classroom culture can have a tremendous influence on pupils' attitude to mathematics and their achievement in the subject, as can external factors such as the arrangement of the furniture in the class, the availability of resources and the length of the mathematics period (Chapin and Eastman, 1996 in Howie, 2002).

There are instructional strategies and activities that teachers may use for reading (Creighton, 1997, Langer, 1995, Storer and Maybin, 1994; Mullis et al, 2004). The activities most relevant for reading literacy development include those that pertain to word recognition, comprehension, cognitive and metacognitive reading strategies, and writing activities such as constructing a story. Activities should be required of the pupils that integrate all of the language processes – reading, writing, speaking, and listening (Shanahan and Neuman, 1997 in Mullis et al., 2004). In mathematics, several classroom instructional methods were associated with pupil achievement. For

instance, the more time that was spent doing problems from textbooks, the higher the achievement of pupils in Grades 4 and 8 (Arnold, 1998, as cited in Howie, 2002).

Homework and assessment are ways to extend instruction and assess student progress (Mullis et al., 2004, p.31), while in Howie's study (2002) homework is seen as a contribution towards pupils' learning, extending the curriculum beyond the classroom. The time spent daily on homework on language, science and mathematics was a significant predictor for 13 out of the 18 countries (Martin et al, 1996, as cited in Howie, 2002). Nevertheless, South Africa pupils that received more homework did not perform significantly better than those with less (Monyana, 1996, as cited in Howie, 2002).

3.7.8 Pupils' background and parental involvement

The background of the pupil is one of the variables that is referred to in many studies as being related to the pupil's performance. The knowledge, skills, aptitudes, attitudes and values the pupils leave school with are to a great extent influenced by the knowledge, skills, aptitudes, attitudes and values they had when they entered school. They are the result of an intricate and complex combination of their genetic composition and their home background (Anderson, 1991).

Pupils' socio-economic status (SES) has been shown to strongly impact on learning achievement (UNESCO, 2008). Recent research consistently shows a strong positive relationship between pupils' performance and SES, or indicators of SES such as the parents' or caregivers' occupation or level of education (Mullis et al., 2004). Howie (2002) and Kotte, Lietz and Lopez (2005), just to mention some studies, stress the relationship between pupils' SES and their performance. The number of books at home is the only variable that provided an additional measure of pupils' socio-economic level and was positively correlated with reading achievement in all countries.

The following variables were combined (use of test language at home, home possession, number of meals per week and number of books at home) and this composite measure was correlated with student reading literacy scores on the reading test at the student level. As expected, the correlations were positive for all countries which thus indicated that "students from homes with higher values on the home circumstances indicator tended to obtain higher achievement scores on the reading test than students from homes with lower values" (Postlethwaite and Ross, 1992, p.22).

Purves and Elley (1994, in Mullis et al., 2004) also stress that access to various types of printed material in the home is strongly associated with literacy development and achievement, and thus with pupils' performance.

Language in the home is also related to pupils' SES. Mullis et al., (2004, p.29) explain that "Learning to read is very much dependent on children's early experience with language. The language or languages at home, and how language is used, are important factors in reading literacy development. Children whose knowledge of the language used in formal reading instruction is substantially below that expected of children of that age are likely to be at an initial disadvantage. In addition, the use of different languages or dialects at home and at school may cause problems for young students learning to read."

Many studies show a positive correlation between the language of a test and the home language of the person taking the test. The stronger the background in the language of the test, the higher the achievement (Australia in TIMSS study, Papanastasiou, 2000). And in the PIRLS study Greaney and Kellaghan (2008) state that "students who spoke the language used in assessment at home tended to have higher scores than students who spoke other languages" (p.117). Howie (2002) found language to be a significant predictor of pupils' achievement in South Africa.

Parental and the community involvement also play an important role in the development of reading literacy. Parents and the community are resources with assets and expertise that are essential for the teachers. Apart from being the primary teachers of their children, parents are privy to special knowledge about their children. They have interest in and commitment to their children's success, and they can also contribute valuable knowledge and skills springing from their interests, hobbies, occupations, and place in the community (Gold and Miles, 1981). Thus, parents' attitudes towards schools have an influence on pupils' performance. There is consistent evidence that parents' encouragement, their activities, the interest they take in their children at home and their participation at school affect their children's achievement, even after the students' ability and the family's socio-economic status is taken into account. Students achieve personal and academic development if their families emphasize schooling, let their children know that they are concerned about their education, and do so continually over the years (Epstein, 1988 in Gold and Miles 1981).

Another important variable that makes a difference to a pupil's performance is the level of the parents' education, especially the education levels of the mother. This is an important determinant of pupils' enrolment as well as of pupils' performance, especially for girls, as confirmed by Chowdhury (1995). Parents who are educated, are more likely to understand the importance of schooling from their own personal experience and are more likely to send their children to school. Studies have found parental education, especially that of the mother, to be an important determinant of school enrolment, retention and achievement.

Mullis et al. (2004) emphasize that parents and other family members convey their beliefs and attitudes through the way in which they teach their children to read and to appreciate text. Christenson, Rounds and Gorney (1992) finds the connection between the home and the school to be important too. Across all of the home factors associated with acquiring reading literacy, parental or caregivers' involvement in children's schooling may be key to literacy development (Mullis et al., 2004). Research shows that pupils who discuss their studies and what they read with their parent or caregivers are higher achievers than those who do not (Mullis et al., 2003). "Parents' or caregivers' involvement can reinforce the value of learning to read, monitor children's completion of reading assignments for school, and encourage children through praise and support" (Mullis et al., 2004, p.30).

3.7.9 Teacher quality

The teacher is another very influential determinant of the classroom environment (Lundberg and Linnakyla, 1993). A teacher's qualities include preparation and training, the use of a particular instructional approach, and experience in teaching reading. This insight is shared by Mullis, Kennedy, Martin and Sainsbury (2004), who indicate that teacher quality is an important determinant of pupil performance.

Anderson (1991) explains that "like their students, teachers differ in terms of the knowledge, skills, aptitudes, attitudes, and values they bring to their classrooms. They also differ in their teaching experience" (Anderson, 1991, p.19). To reach the goals fixed by the Mozambican Ministry of Education, it is vital to equip teachers with the appropriate knowledge and skills that they need to teach. The quality of education hinges on the quality of teaching that goes on in the classroom reinforcing the idea that quality teachers make up for the deficiencies in the curriculum and in educational resources.

A good teacher can correct and adjust the curriculum and the syllabi to a specific context, and to their pupils' interests and motivation in order to achieve the goals defined by the Ministry of Education. Because it is not always possible to change the situations in which teachers work, the best way of inducing adaptation to a constantly changing context is to provide teachers with the appropriate knowledge and training to teach. One way of doing this is to equip them with the knowledge and skills that will increase their ability to provide improved opportunities to learn for all of their pupils. This training should increase the teacher's self-confidence and expertise in handling different classroom situations, thus responding to the different learning styles and rates of the pupils, and different class sizes and settings (Hargreaves and Fullan, 1992).

The above is well illustrated in Finland where a higher performance in mathematics is contributed to pre-service teacher training. Pre-service teacher education in Finland firstly, ensures that highly motivated students are recruited for their sought-after training programmes where the number of applicants for primary teacher education is 5-6 times the number of places available (Malaty, 2006).

Secondly, on completion of the programmes, these students move into the schools with a high-level teacher education qualification. Every schoolteacher must achieve a Masters degree: an M. Ed. for a primary school teacher (Grades 1 - 6) and an M.A. or M.Sc. for a secondary school teacher (Grades 7 - 12) (Malaty, 2006). One of the most popular studies in higher education is primary teacher education (Grades 1-6) where teachers are known as class because they must be able to teach all subjects to a class (Malaty, 2006). Thus, if teachers are well qualified and are equipped with appropriate knowledge and skills, their self-confidence and expertise in handling different classroom situations will be developed, leading to a more satisfactory teaching and learning experience where pupil performance is enhanced.

High-achieving schools have teachers with sound knowledge of their subject matter, sound pedagogical knowledge and skills, and good classroom management skills. These teachers usually demand a lot from students but are supportive of their students and get feedback systematically from the students on which types of objectives the students have attained, and give help to those who are having problems. They have a good knowledge of the education system's aims, understand the syllabi are equipped with the necessary resources, and have a good knowledge of which teaching strategies are most likely to address these aims (Postlethwaite and Ross, 1992).

In addition to teacher quality, lack of resources for the teaching and learning process has been identified as a factor of low performance in many schools. Pupils attending primary school in countries with low per capita incomes tend to have learned substantially less after similar amounts of time in school than have pupils in high-income countries. In low-income countries, the effect of school and its resources as well as teacher quality is comparatively greater on academic achievement in primary schools (Heyneman and Loxley, 1983). This data, which is more representative of the world's population of schoolchildren than those used in previous studies, illustrate that the "predominant influence on student learning is the quality of the schools and teachers to which children are exposed" (p.1162).

In cross-national studies, it is significant to take into consideration the number of years teachers have spent acquiring their education (Lundberg and Linnakyla, 1993). This period usually varies considerably across countries. To some extent, these variations reflect differences in how the

teaching profession is valued in different countries. In some countries, teacher education provided at universities or at special teachers' colleges as a substantive higher education programme. In other countries, university studies oriented towards specific disciplines precede the specific teacher training. Policy makers generally assume that prolonged education will create more competent teachers and higher teaching quality. The varying patterns and the varying interpretations of the concept of teacher education make it difficult to compare the length of education across countries.

In the SACMEQ countries, for instance, the recruitment of candidates for teacher education is from secondary schools. For teachers of Grades 10 to 12 the duration of training varies from two to four years. These differences in the teacher training approach may make a difference in teacher performance and consequently in pupil performance. One of the variables to take into consideration in the analysis of pupils' performance is the teachers' experience.

According to Lundberg and Linnakyla (1993), there is a relationship between teaching experience and student achievement. Teaching is a complex and demanding profession that requires skill in management and fast decision making, independent judgement, patience, empathy, communication skill, careful planning, stress tolerance, deep subject knowledge and psychological insight. One cannot acquire a high level of expertise within only a few years of practical teaching experience. Therefore, the more experienced the teacher is the better performance that can be expected from students. In the TIMSS study, more than 80% of students were taught by teachers who had at least some professional training in mathematics. More than 80% of students were taught by teachers who had at least some professional training in mathematics (Greaney and Kellaghan, 2008).

In New Zealand, major factors were identified as potentially responsible for the poor performance of primary school pupils in TIMSS which include poor understanding of mathematics by teachers, low morale of teachers, classroom disturbance and bullying, lack of appropriately challenging learning materials, ineffective implementation of intended curricula, and ineffective assessment procedures (Macnab, 2000).

The gender of a teacher makes some difference in pupils' performance as related to the teacher's performance. The data showed that 71% of primary school teachers were female. Across countries, the proportion of female to male teachers in primary schools was varied - "from 98% in Slovenia to only 46% in Indonesia" (Elley, 1992, p.40). In some countries, female teachers significantly outperformed male teachers. In the IEA Study of Reading Literacy for 9-year-olds (1991), "there were ten countries with strongly significant differences ($p < 0.001$) between female and male teachers as to how their students performed on the reading tests (Canada, Cyprus, Greece, Hong Kong, Iceland, Indonesia, Spain, Sweden, Trinidad and Tobago, and Venezuela), and in all cases,

female teachers had better students” (Lundberg and Linnakyla, 1993). Postlethwaite and Ross (1992) have also observed that schools that were more effective in reading had more female reading teachers than male teachers.

In contrast, in the IEA Study of Reading Literacy (1991) boys in Nigeria and in Germany achieved well and had more often been taught by male teachers than boys in Canada and the United States, where the boys fared less well than girls. A plausible explanation is that boys identify better with the values of male teachers than with those of female teachers (Elley, 1992, p.55). However, in many countries, students taught by female teachers scored higher than students taught by males, especially at lower grade levels.

From these results, one can conclude that it may be better for pupil performance to have female teachers in primary education in certain countries. But in the era of gender balance it is very difficult for decision makers to implement this proposition. It may be important to find out the reasons why female teachers have better results.

3.8 SUMMARY

A number of authors see competence as something describing an action, behaviour or outcomes that can be demonstrated, observed and assessed. According to Tomlinson (1995, p.181) “competence or skill signifies a more or less consistent ability to realize particular sorts of purposes to achieve the desired outcomes.” A competent person is capable of certain acts or actions in the context in which the person has competence, and is likely regularly to achieve an intended outcome in that context.

Westera (2001) claims that the concept of competence is strongly associated with the ability to master complex situations - and it is assumed that “competence” transcends the possession of knowledge and skills to include the ability to explain how knowledge skills are applied accounts for the effective use of knowledge and skills in specific and concrete contexts. However, the mastery of relevant knowledge and skills alone is no guarantee of successful performances in complex environments. Individuals should be able to select from their available knowledge and skills in such way that efficient and effective behaviour occurs taking into account the characteristics of a specific context.

The conceptual framework defined by Cheng and Tsui (1998) for teacher effectiveness has the advantage of showing the model using three dimensions and three domains: cognitive, affective and behavioural; three levels: individual, group and school; four layers: teacher competence,

teacher performance, student experience and student performance; and other important components of teacher effectiveness, such as the external teaching context and the internal teaching context, and the relationship between all of these.

From a professional point of view, competence is important and a distinct category through which to classify different professionals according to their performance. As in any evaluation it is very difficult to make a difference between different levels of competence and skills. Measurement of teacher competence in terms of student performance is often difficult because many variables are involved. Nevertheless, there seems to be a direct relationship between teacher training and pupil performance of the curriculum.

In primary schools, pupil outcomes are determined in some ways by teachers' competence. International studies have shown that in terms of pupil performance it can be observed that the difference between most developed countries is not very great, but that there are real, stable differences in reading literacy levels between nations. All of the developing countries tend to have lower achievement levels than the industrialized nations. In general, their economic position is weaker and they lack long-standing literacy traditions (Elley, 1992).

Reading skills are also a foundation on which the learning of all other subjects is established. Reading skills depends on the internal and external efficiency of the school system. Reading is a basic skill and plays an important role in the citizens' daily lives as well as in a country's development. In cross-international studies of reading and mathematics, the findings have shown that there are differences between the performance of girls and boys, where girls tend to have better results in reading than boys, but boys have better results in mathematics than girls.

Finally, it is crucial to take into consideration the different variables that have an effect on pupil performance, such as the teachers' characteristics and the quality of teaching and learning, the pupils' background and parental involvement, as well as the school's location and facilities.

The next chapter provides and discusses information about the SACMEQ II study in Mozambique, as well as cross-international studies.