

The SACMEQ II Project in Tanzania:
A Study of the Conditions of Schooling
and the Quality of Education.

Tanzania
Working Report

by

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Foreword

The origins of the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) date back to 1991, the year when several Ministries of Education in Eastern and Southern Africa started working closely with the International Institute for Educational Planning (IIEP) on the implementation of integrated educational policy research and training programmes.

In 1995 these Ministries of Education formalized their collaboration by establishing a network that is widely known as SACMEQ. Fifteen Ministries are now members of SACMEQ: Botswana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania (Mainland), Tanzania (Zanzibar), Uganda, Zambia, and Zimbabwe.

SACMEQ is registered in Zimbabwe as an Independent Intergovernmental Non-profit Organization. Its Coordination Centre is located within UNESCO's Harare Cluster Office and is managed by a Director who works under the guidance of a six-member Managing Committee. SACMEQ's Assembly of Ministers meets every two years and provides overall policy guidance concerning SACMEQ's mission and programmes.

The focus of SACMEQ's capacity building programmes has been on building the capacity of Ministries of Education to monitor and evaluate the quality of their basic education systems. SACMEQ employs innovative training approaches that include a combination of face-to-face training, hands-on experience, computer laboratory sessions, and on-line support via the Internet. SACMEQ also encourages a unique form of collaboration among SACMEQ National Research Coordinators in the fifteen member countries as they share and exchange skills and successful experiences.

In September 2004 SACMEQ was awarded the Comenius Medal for its innovative approaches to delivering cross-national educational research and training programmes.

This report provides a description of the results of the SACMEQ II Project - SACMEQ's second major educational policy research project. The results of the SACMEQ I Project were reported in seven national reports for Kenya, Malawi, Mauritius, Namibia, Zambia, Zimbabwe, and Tanzania (Zanzibar).

The SACMEQ Data Archive was launched in June 2004. This valuable information resource contains data, data collection instruments, manuals, technical papers, and related publications from both SACMEQ projects. Copies of the archive may be obtained by completing the registration form on the SACMEQ Website (www.sacmeq.org).

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Chapter 1

The setting for the study

Introduction

Tanzania Mainland lies between 1⁰ and 12⁰ south of equator and between 29⁰ and 41⁰ east of the Greenwich Meridian. It shares a border with Kenya and Uganda to the north and Mozambique, Malawi and Zambia to the south. To the east lies the Indian Ocean while Rwanda, Burundi, and the Democratic Republic of Congo are to the west. Tanzania has a landmass of 881,000 square kilometres and, according to the 2002 population census, it has a population of 33.6 million people. The population growth rate is 2.9 percent per annum. The population consists of people from about 120 different tribes, each with its own language. However Kiswahili is spoken by all tribes and is the national language as well as the main language of official communication while English is the second official language. Kiswahili is the medium of instruction in primary schools while English is used as the medium of instruction in secondary schools and in post-secondary education. Christianity and Islam are the main religions practised by more than 90 percent of the population, but each has many different sects. Tanzania was a British protectorate for 42 years, that is, from 1918 to 1960 before it became independent in 1961. It is a multiparty state and enjoys strong friendship and cooperation with its neighbours mainly through its membership to the East African Community (EAC) and the Southern Africa Development Community (SADC).

The economy

Agriculture is the mainstay of Tanzania's economy, and it contributed 47.5 percent of the Gross Domestic Product (GDP) in 2002. Other main economic activities contributing to the GDP are construction (5.0%), manufacturing (8.4%), mining and quarrying (2.7 %), trade, hotels, restaurants including tourism 16.6%), transport and communication (5.5%), financial, insurance, real estate, and business services (10.0%), public and other services (7.3%) electricity and water (1.6%). In 2002, the GDP growth rate was 6.2 percent and the per capita GDP is 256,490 Tanzanian shillings (shs) at 2002 prices where one US dollar was equivalent to 265.4 shs.

However the income disparity is large and there are many families, especially in rural areas, that depend on subsistence farming. About 50 percent of the population lives below the poverty datum line. The national transport system is being reworked through construction of trunk roads which when complete will connect almost all regional towns.

The contribution of the other sectors to the economy has been summarised in Table 1.1.

Table 1.1: Tanzania's economy: A summary

Contribution Sector	(as % of Total GDP)
Agriculture	44.7
Restaurants, hotels and tourism	11.9
Finance, real estate and business services	14.3
Manufacturing	7.3
Public and other services	10.3
Transport and communication	4.7
Construction	5.4
Mining and quarrying	1.8
Electricity and water	1.7
(Less bank services)	-1.9
Total	100.2

Source: Economic Survey 2003 published in 2005

The perceived importance of SACMEQ

This study is part of the work of the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ). The collection of data for the SACMEQ II study took place in 1999-2000 and this publication reports the results of this study. SACMEQ II focussed on Standard 6 and it assessed achievement in both mathematics and reading literacy.

Before SACMEQ II, the only indicator of the achievement of pupils was from the Standard 7 Primary School Leaving Certificate. One problem was that these data is that they were not regularly analysed to examine either the differences in achievement between the educational administrative zones or subgroups of pupils in the country across different points in time. The SACMEQ II study is expected to generate very useful policy suggestions and a policy agenda for

action by the Ministry of Education and Culture (MOEC). These policy suggestions will not only dwell on the Standard 6 achievement in reading literacy and numeracy but also with actions required in order to improve the conditions of learning in the schools. It will also enable the Ministry to monitor change, if any, in many key education indicators in the various zones since the time of SACMEQ II onwards.

School education in Tanzania

At the time of independence, around 488,476 children (27% of an age group) were enrolled in primary school. Enrolment in secondary schools was 11,832, which was only 2.4 percent of the children enrolled in primary schools. During the mid seventies, the Ministry made the first significant strides in opening up access to and participation in primary education for all children of school age by providing adequate teachers and necessary school buildings in all parts of the country. By 1982, Tanzania had very nearly achieved universal primary education (UPE), with around 98 percent of children in school. These impressive achievements, were, unfortunately, not sustained. Nevertheless, the efforts were renewed following the adoption of the Education and Training Policy of 1995 that was implemented through the Primary Education Development Program (PEDP) 2001-2006. The target of the PEDP was, among others, to ensure that all school age children were admitted in school by year 2006. During its first year of implementation, that is year 2002, there was tremendous expansion of enrolment with Gross Enrolment rates (GERs) and Net Enrolment rates (NERs) reaching 98.6% and 80.7% respectively compared to GERs and NERs of 84.0 percent and 65.0 percent respectively during year 2001. Although most parents see the value of education and send their children to school, there are still some areas where the parents have not yet fully appreciated the value of education. Nevertheless, good progress continues to be registered, and the goal of PEDP is to ensure that all children of school going age are enrolled in school by the year 2006.

Financing of education

The provision of education has continued to be Government's priorities. The average percentage of the government budget devoted to education in the period 1995/96-2000/01 was 24.15 percent

of the national discretionary expenditure budget (i.e. total recurrent budget less debt service etc). The allocation to the various aspects of education, in percentage terms, has been presented in Table 1.2 (using averages for the time period 1995/6-2000/01).

Table 1.2: Percentage of budget spent on the different levels of education

<i>Level of education</i>	<i>Percentage of Education Budget</i>
Primary	65.90
Secondary	8.07
Tertiary	21.37
Teacher Training	2.17
Administrative costs (including repayment of loans, etc)	2.49

Source: Basic Statistics in Education (2003)

Main education reforms

Several reforms were implemented in the 1990s following the release of the 1982 report of the education sector analysis (Makweta Report, 1982). These reforms were also prompted by other government macro level policy reforms that necessitated corresponding changes in the education sector. The review of the primary, secondary, and teacher education curricula was accomplished in 1993. This review involved the revision of syllabi and textbooks, the production of teacher guides and the orientation of teachers in the use of the new teaching materials and methodologies in order to make them more relevant to the realities of Tanzania's overall context.

The Education and Training Policy (ETP) of 1995 provides the vision and mission that guides the development of the entire education and training sector. The major objectives of this policy are to expand access to education, achieve equity in its provision, and enhance the quality of the education offered. Furthermore, it seeks to ensure optimum utilisation of facilities, and therefore achieve operational efficiency at all levels of the system. The other broad policy aims include enhancing partnerships in the delivery of education, broadening the financial base of the sector, achieving greater cost effectiveness in education, and streamlining education management structures through the devolution of authority to schools, local communities and local authorities (LAs). The ETP, in turn, promoted the development of the Policy for Science, Technology, and Higher Education in 1997.

The 1995 ETP was followed in 1996 by the development the Basic Education Master Plan (BEMP) whose objective was to translate into action areas of the ETP that were related to the basic education sub sector. In 1997 the sector-wide approach, namely, the Education Sector Development Programme (ESDP) was adopted to establish new relationships with key players in education using pooled human, financial, and material resources for the tasks of managing education, and thus enhancing partnerships, facilitating co-ordination, and instilling a sense of ownership amongst all stakeholders in education. This culminated in the development of the Primary Education Development Programme (PEDP) 2002-2006. The PEDP is a five-year plan that articulates the vision of UPE within a decentralised mode and the framework of the Local Government Reform Programme, the Poverty Reduction Strategy Paper, and the Tanzania Development Vision 2025. It covers the provision of primary education, including education for out-of-school children and youth as well as capacity development of personnel and structures at the local level. The targets of priority investment under PEDP are the expansion of access through a focus on classroom construction, teacher recruitment and teacher deployment, quality improvement encompassing through in-service and pre-service teacher training, and increasing teaching and learning materials provision. PEDP also aims to effect system-wide management improvements through a range of capacity building efforts.

Structure of education in Tanzania

Tanzania's formal education system follows a 2-7-4-2-3+ structure. The first 2 years comprise pre-primary education followed by 7 years of primary education, 4 years of ordinary level secondary education, and 2 years advanced level secondary education. University education ordinarily covers a minimum of 3 years.

(a) Pre-primary education

The provision and management of pre-primary education rests with the government, individuals or private institutions. About 581,022 of children aged 5 to 6 years were enrolled in 9,569 pre-primary schools during 2002. Pre-primary education is not compulsory. Pre-school teachers are required to undergo formal training before they can teach in pre-schools. There are far more pre-

primary institutions in urban areas than there are in rural areas. Enrolment in these schools is expected to increase steadily as more preschool classes open on government primary school premises.

(b) Primary education

Primary school covers Standards 1 to 7 and the legal age of entry to primary school is 7 years. At independence in 1961, there were 3,342 primary schools and 65 secondary schools in Tanzania. Since the declaration of Education for All in the early 1970's, there has been a steady increase in primary school enrolments. These efforts were renewed by the adoption of the 1990 Jomtien Declaration on Education for All. As a result, by 2002 there were 12,152 primary schools with 5,981,338 pupils enrolled.

Usually Standard 1 and 2 have classroom teachers while the others have subject-matter teachers. Thus, from Standard 3 onwards, pupils are allocated a classroom and the teachers move from classroom to classroom for the different lessons.

There are 194 school days per year. Each day a pupil should receive between three and four hours of school learning per day (that is, 8 lesson periods of 40 minutes each for Standards 3 to 7 and 30 minutes each for Standards 1 and 2). It is Ministry requirement that teachers give homework, exercises as well as tests, and that they correct them regularly. However, the conditions in some pupils' homes are not conducive for doing homework and so it remains unclear how much homework is actually done. At the end of Standard 7 pupils sit for the Primary School Leaving Examination (PSLE). The examination acts as a selection examination for entry into secondary school. In addition they are awarded a certificate for having reached Standard 7.

Each school should be fully inspected by an inspector at least once every 2 years. The inspectorate has been reformed to perform inspectorial as well as advisory functions. There are accurate records of the actual number of visits by inspectors to schools in each district.

(c) Secondary education

As already explained, secondary education is split into ordinary and advanced level secondary education. There are four and two years of education respectively for each level. There were 1,024 secondary schools enrolling 976,694 students in year 2002. Only 21 percent of pupils from primary level make a transition to ordinary level secondary education and 27 percent of the Ordinary level pupils proceeded to Advanced level secondary education. The department has ambitious targets of increasing transition rates from primary level to secondary level from the 21 percent in 2002 to 50 percent in year 2015. Other targets include:

- (i) widening access to secondary education of the secondary education age group of 14-17 years of age, from the current 7% to 30% by the year 2015;
- (ii) expanding secondary education and thus raise the percentage of those who pass Form 4 and 6 national examinations with Divisions I, II, and III from 25% in the year 2001, up to 50% in 2003; and
- (iii) offering equitable secondary education to all regions and districts.

The department is preparing a secondary education master plan which will guide the implementation of programmes that will see the achievement of the set targets.

(d) Teacher education

There were 41 teachers colleges with a total enrolment of 12,296 teacher trainees in year 2002. The colleges provide teacher education at diploma and Grade A levels. Diploma trainees are prepared to teach in secondary schools while Grade A trainees are earmarked to teach primary and pre-primary schools. The colleges also provide in-service training to teachers who wish to upgrade themselves from lower grades (Grade C or B) through residential training and distance learning.

University education

University education is provided in 4 state universities and 8 private universities. State universities enrolled 16,396 students in 2002, of which 24 per cent were females. Students' enrolment in private universities was 1,779. The academic staff/student ratio in 2002 was 1:12 in

state universities and 1:05 in private universities. Teacher/student ratio in private universities is low compared to the standard of Sub-Saharan Africa of 1:12.

Administrative structure

In 2000, the country was divided into 20 regions (which have since increased to 21 in 2002) and each region is sub-divided into a number of districts varying from region to region. There are 113 districts (which have increased to 120 in 2002). A Regional Education Officer (called Regional Education Specialist from 2002) coordinates all regional education matters. A District/Municipal Education Officer heads District/Municipal education office, while the Ministry has overall responsibility for the running of the education system and each district/municipal office is responsible for the school buildings in its area as well as for the supply of equipment and materials to the schools. The Ministry has a national inspectorate whose task is to conduct a full inspection of each school in the country once every two years. Each district office also has a team of school inspectors whose task is to visit each school in the district at least twice a year and to advise and help all teachers with their teaching. There are no regional school inspectors but rather zonal school inspectors who visit schools, mainly secondary schools, and teachers colleges. Some of the zones, districts and wards have also established Educational Resource Centres. However, those at ward level, although closest to the teachers, are few and are in their infancy, and there is very limited information about how they are operating. The Ward Based Education Management (WABEM) and Child Friendly Schools (CFS) initiatives aim to revitalize and consolidate the existing ones, and to establish some where none exist.

The regions in Tanzania

There were 20 regions during the time of the survey (21 regions beginning year 2002) that make up Tanzania Mainland., namely Arusha (Arusha and Manyara) Dar es Salaam, Dodoma, Iringa, Kagera, Kigoma, Kilimanjaro, Lindi, Mara, Mbeya, Morogoro, Mtwara, Mwanza, Pwani, Rukwa, Ruvuma, Shinyanga, Singida, Tabora, and Tanga. These regions vary considerably in

their topography, population density, main economic activities, infrastructure and other essential characteristics. Some background information on each one of them is provided below.

Arusha: This is a region which hosts the headquarters of the East Africa Community. It has ten districts and it is thinly populated. It is primarily rural and has most of the country's national parks. There is animal husbandry and tanzanite mining. Tourism is very intensive due to fact that the region has the most renowned national parks including Serengeti, Ngorongoro and Manyara, and has a very good infrastructure.

Dar es Salaam: This region includes Dar es Salaam, the largest city that has three municipalities. It is the most densely populated region in the country, and is almost entirely urban. Dar es Salaam has excellent infrastructure, and is accessible by air, road, railway and water. It has a cosmopolitan population which is a mixture of national ethnic groups, mainly workers, and different races. It has a good concentration of light industry, and is the biggest commercial centre in the country, with a lot of tourism. The demand for education is very high here due to the constant influx of people who are in search of the many opportunities offered by this relatively well developed region.

Dodoma: The region houses Dodoma, the capital city of Tanzania. It comprises four districts. Although Dodoma is largely rural and semi arid, it is densely populated. Animal husbandry is practised on an intensive scale, with some subsistence farming. The region's infrastructure is good.

Iringa: This region is mountainous. It has five districts and it is rural. Both commercial and subsistence farming are practised on an intensive scale. The big tea estates often tempt pockets of children to work in them instead of attending school. The infrastructure is good.

Kagera: This is a peripheral, rural region located in the north-western part of the country. It comprises five districts that share a border with Uganda, Rwanda and Burundi. Kagera region is densely populated, and its inhabitants practise subsistence and commercial farming. There is coffee and sugarcane industry as well as some tin mining. There are refugee camps and the

intensive activities of the refugees characterised by farming and tree cutting (for firewood) have resulted in severe land degradation in the areas surrounding the camps. The infrastructure is good.

Kigoma: This is a peripheral, rural region with three districts that are located in the western part of the country, sharing a border with the Democratic Republic of Congo and Burundi. It is thinly populated. Its inhabitants engage in subsistence and commercial farming. As is the case with Kagera, in Kigoma there are refugee camps that have caused severe land degradation in areas surrounding the camps. The infrastructure is fair.

Kilimanjaro: This region is largely rural, and is made up of five districts. It is largely mountainous, with Mount Kilimanjaro, the tallest mountain in Africa, situated in this region. It is very densely populated and is agriculturally very productive. In the most common economic activities are subsistence and commercial farming, with coffee estates, bananas, and maize being the main products. There is also some tourism and limestone mining. This region has good infrastructure.

Lindi: This region is located in the south of the country, and has six districts. It is largely rural and is densely populated. The main economic activities in this region are cashew nuts production, sisal growing, fishing, and salt making. The infrastructure is fair.

Mara: Bordering Lake Victoria, this region is largely rural with districts. It is densely populated, and here we find intensive agriculture, animal husbandry and fishing. There is some gold mining. The infrastructure is good, and the region is easily accessible by air and by road.

Mbeya: This region is largely rural, and is made up of eight districts. It is partly mountainous but is densely populated. It is agriculturally very productive, with coffee, rice, pyrethrum, maize and bananas as the main crops grown. There is also some gold and iron ore mining. The infrastructure is very good, and the region is accessible by road, railway and air.

Morogoro: This region is mountainous and largely rural, with five districts. It is thinly populated but agriculturally rich. The main crop grown is sugarcane. There is also some mica mining. The infrastructure is fair except in the mountains where access is problematic.

Mtwara: This region is largely rural and is densely populated. It is made up of five districts. Inhabitants of this region engage in the production of cashew nuts, sisal growing, fishing, and salt making. The infrastructure is fair.

Mwanza: Bordering Lake Victoria, this region is largely rural with seven districts and is very densely populated. Here, we find intensive agriculture with a lot of animal husbandry in addition to fishing and gold mining. The infrastructure is very good, and the region is accessible by air, railway, train, and by road.

Pwani: This region is largely rural and has four districts. It is thinly populated, with some mica mining and subsistence farming. The infrastructure is good.

Rukwa: Rukwa Region is rural, and has four districts. There is intensive farming, but mainly of a subsistence nature. Some iron ore mining also takes place here. The infrastructure is fair.

Ruvuma: This region is largely rural and is partly mountainous. It has five districts, and practises intensive agriculture. There is also some iron ore mining. The infrastructure is good.

Shinyanga: This region is largely a rural lowland with five districts. It is densely populated and is agriculturally very productive. Inhabitants of Shinyanga engage in subsistence and commercial farming, with rice, cotton and animal husbandry as the main economic activities. There is also diamond and gold mining. The infrastructure is good.

Singida: The region is largely rural, and has eight districts. It is partly mountainous, agriculturally productive, and densely populated. There is gold and iron ore mining too, and its infrastructure is good.

Tabora: This region is largely rural, thinly populated and has five districts. Tobacco, cotton and some subsistence farming and animal husbandry constitute the main occupation of inhabitants. The infrastructure is good.

Tanga: This region is largely rural and has six districts. It is highly populated and intensive agriculture is practised, with a mixture of subsistence and commercial farming. There are sisal and tea plantations, cotton and coffee growing, fishing and some tourism. The infrastructure is good.

A map of Tanzania with the regions marked has been presented in Figure 1.1.

Policy concerns

Since there were several reforms in the last decade that influenced the management and administration of education, particularly primary education, the Ministry of Education and Culture needs to be informed on the conditions of schooling and of the achievement levels in the 21 regions. The major concerns for which 'hard' facts are needed are:

1. How different are the inputs to schools in the various regions in terms of the kinds of homes the pupils come from?
2. How different are the conditions of schooling in the regions in terms of the textbooks and other supplies available to pupils, the adequacy of accommodation in the classrooms, the resources in the classrooms and the resources in the schools? Where are the conditions deemed to be inadequate and what action should the Ministry take?
3. How do the conditions of schooling in Tanzania compare with the Ministry's own benchmarks standards? In which regions are there large gaps? Did the Ministry's benchmarks seem to be reasonable or are changes required?

4. How equitably have the educational inputs (both material and human) to primary school been allocated? For which types of input was there inequity? Is any action required by the Ministry?
5. What is the level of achievement of Standard 6 pupils in reading and mathematics? Can the achievement levels be said to be adequate or were there major problems? If so, where? What is the level of achievement of the teachers of the Standard 6 pupils in Reading and Mathematics? Is there any overlap in achievement between pupils and teachers?

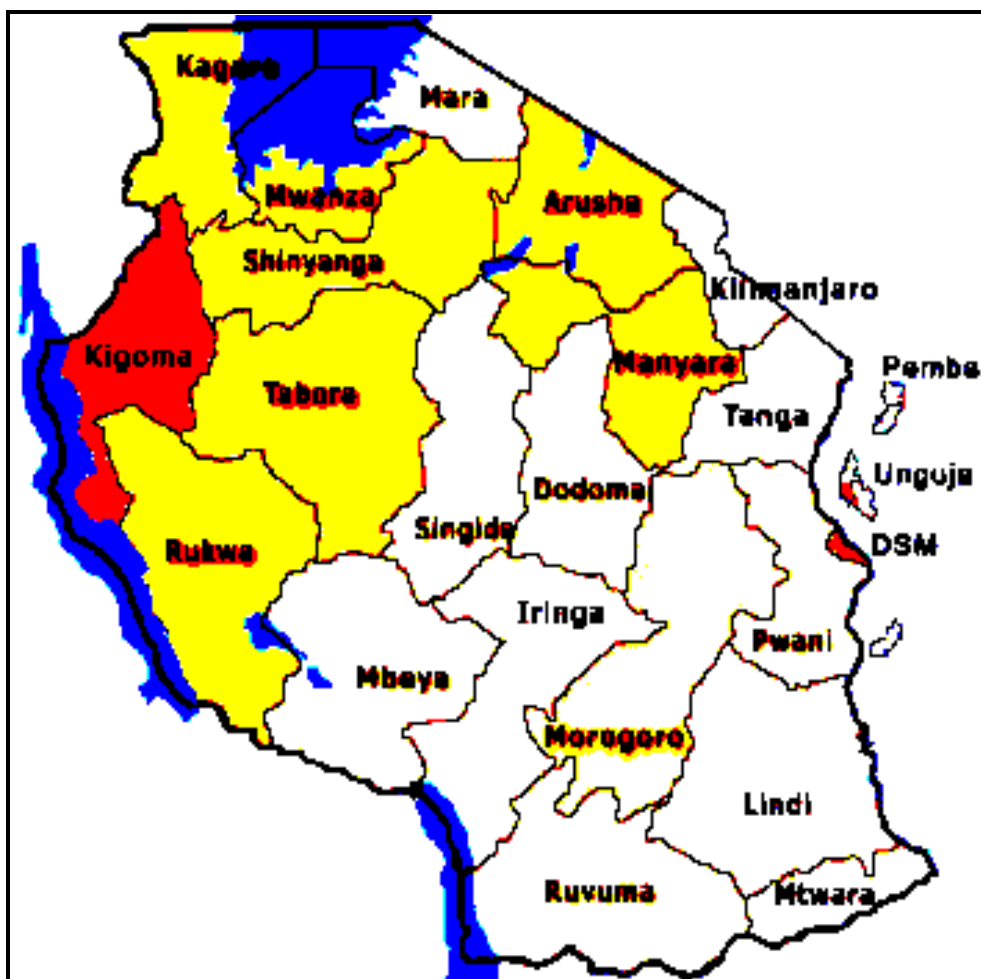


Figure 1.1: The administrative regions of Tanzania

The structure of the report

The rest of this report is devoted to providing information from the SACMEQ study to address the above questions. In Chapter 2 the conduct of the study has been summarised by establishing the policy research questions, the development of the instruments, test development and the subsequent scaling procedures, the population tested, the sampling procedures used and the calculation of sampling errors, the data collection, the data entry, cleaning, weighting and analysis.

Data on pupils' characteristics and their learning environments have been reported in Chapter 3. Information on teachers' characteristics and their viewpoints on teaching, classroom resources, professional support, and job satisfaction has been given in Chapter 4. The analyses of the extent to which school heads' characteristics and their viewpoints on educational infrastructure, the organization and operation of schools, and problems with pupils and staff have been reported in Chapter 5. In Chapter 6, the results of the analysis of the equitable allocation of educational inputs to regions and also to school within regions have been reported. The achievement results of both pupils and teachers in reading and mathematics have been reported in Chapter 7. In Chapter 8 the major results have been summarised and suggestions for action by the Ministry have been made.

Chapter 2

The conduct of the study¹

In this chapter, an account of the main technical procedures that were involved in the design and implementation of the SACMEQ II study in Tanzania Mainland have been provided. The SACMEQ II Project commenced in 1998 and involved 15 Ministries of Education in 14 countries.² The participating countries were: Botswana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania (Mainland), Tanzania (Zanzibar), Uganda, Zambia, and Zimbabwe.³ SACMEQ II project was preceded by SACMEQ I project which commenced in 1995 where 7 countries participated namely: Kenya, Malawi, Mauritius, Namibia, Seychelles, Tanzania (Zanzibar) and Zambia. Tanzania (Mainland) did not participate in the SACMEQ I Project.

Moving from the SACMEQ I Project (covering around 1,100 schools and 20,000 pupils in seven countries) to the SACMEQ II Project (covering around 2,500 schools and 45,000 pupils) resulted in a major increase in the scale and complexity of SACMEQ's research and training programmes. The chapter has been presented in several parts: the planning of the study, instrument construction, sampling, data collection, data entry, cleaning and merging, data analysis and the writing up of the results. It unfolds efforts of developing countries in establishing mechanisms for monitoring and evaluating the quality of education systems.

The study was designed to provide valid and reliable information on selected indicators of educational inputs, conditions, and outcomes that are suitable for use by decision-makers when planning the improvement or revision of existing policies. The study included instrumentation that was suitable for collecting information to inform the Ministry, teachers, and parents about the reading literacy and mathematics achievement of Standard 6 pupils during year 2000. The

¹ A very detailed account of the conduct of the SACMEQ II study has been presented as Chapter 2 on the SACMEQ website: SACMEQ.org

² Please note that Tanzania (Mainland and Tanzania (Zanzibar) make up the United Republic of Tanzania, which is one country. However, since education is not a Union matter, there two have separate ministries of education.

³ Although Zimbabwe took part in preparations for the SACMEQ II Project, it did not collect data and thus did not actively participate in the SACMEQ II Project.

information provided by the study therefore helped to focus the Ministry's attention on what should be done to improve the current situation, and on setting priorities to enable Tanzania to meet basic access and learning needs within the context of the National Education and Training Policy and the goals set by 1990 Jomtien Conference and reaffirmed at the Dakar World Education Forum of 2000.

At the level of researchers and planners, the study assisted in the development of procedures to identify what information to collect, and how this information should be analyzed and interpreted. In short, the study helped to enhance the research skills of the Ministry personnel in Tanzania (Mainland).

Planning of the study

The study began by first, engaging National Research Coordinators (NRCs) to identify the major policy concerns and specific research questions that were of interest to the ministries of education in the fourteen countries actively participating in SACMEQ II. The SACMEQ NRCs for each of the fourteen countries initiated discussions with the senior members in their ministries of education in order to identify priority policy concerns associated with their education systems. The responses from all countries were then analyzed in order to identify groups of 'General Policy Concerns'. As a result there emerged twenty general policy concerns which can be summarized under five themes:

- Pupils' characteristics and their learning environments.
- Teachers' characteristics and their views about reaching, classroom resources, professional support, and job satisfaction.
- School Head's characteristics and their views about educational infrastructure, the organization and operation of schools, and problems with pupils and staff.
- Equity in the allocation of human and material resources among regions and among schools within regions.
- The reading and mathematics achievement levels of pupils and their teachers.

Along each of the twenty general policy concerns specific research questions were developed. For each specific research question a dummy table (blank table) was developed. In Appendix 2.1 each of the general policy concerns has been presented. In Chapters 3-7 in this report the results have been presented in a series of tables. The blank versions of these tables were the dummy tables. The main reasons for producing the dummy tables were that this process forced the NRCs to (a) check that the data collection instruments covered all information needs, (b) ensure close linkages between the specific research questions and the questions on the data collection instruments, (c) reach agreement on the selection of variables and the types of data analyses to be applied, and (d) design and justify the data tabulation templates to be used in reporting the data analyses. It is important to note that this meant that the study was based solely on what the participating ministries had deemed to be important general policy concerns. In all, there were 20 general policy concerns encompassing 75 specific research questions that resulted in around 150 dummy tables.

Instrument construction

Each of the 150 dummy tables included the names of variables to be used as well as the form in which they would be analyzed. These variables were listed. Most of them could be regarded as variables for which information would be required from pupils, teachers, or school heads using questionnaires. A few of the variables required information to be collected from pupils and teachers using tests. In some cases, one dummy table was sufficient to provide the required information to answer the policy question, but in other cases three or four dummy tables were needed to answer the policy question. In most cases each table has been broken down by zones (i.e. several administrative regions clustered together because of either their developmental, cultural or geographical homogeneity). This was necessary because although the school system operated on the basis of regional administration, using the 20 administrative regions would have resulted in a much bigger sample and much greater costs and time for carrying out the research. Eleven zones were constituted. The zones and their regions in brackets were: Kilimanjaro (Kilimanjaro), Northern (Arusha and Mara), Northeast (Tanga, Morogoro) Southern (Lindi, Mtwara and Ruvuma), Eastern (Dar es Salaam and Pwani), Southwest (Kigoma and Rukwa), Western (Tabora, Kigoma), Southern highlands (Iringa and Mbeya,), Kagera (Kagera), Mwanza (Mwanza), Central (Singida, Dodoma).

Questionnaire construction

Agreement was reached among NRCs on the design of questionnaires and tests and a decision taken that the data collection for the SACMEQ II Project should be expanded beyond the SACMEQ I Project to include an assessment of both reading and mathematics performance levels for pupils and teachers. Dummy Tables (blank or empty data tabulation templates) were produced to guide the construction of questionnaires for pupils, teachers, and school heads.

The variables in the dummy tables were listed and for each variable a decision had to be made about the number of questions that would be required to construct each variable. In some cases (e.g. pupil gender) only one question was needed. For another variable (e.g. school enrolment) two questions had to be added together (boys enrolment and girls enrolment). In yet other cases, several variables had to be formed into a construct (e.g. 'possessions in the home', 'quality of home' and 'parental education' to form a construct known as 'home background'). Questions were developed for each variable or each sub-part of a variable required. These were then tried out in the pilot study and, where necessary, revised.

Test construction

A comprehensive analysis of the official curricula, school syllabi, textbooks, and examinations that were used in SACMEQ countries was done. This analysis was used to construct test blueprints as frameworks for writing a large pool of test items for pupils and teachers in both reading and mathematics. The resulting structure of the pupil tests was congruent with the content (domains) and behaviours (skills) derived from detailed analyses of the curricula, syllabi, exams, and textbooks used in the SACMEQ. Test questions were developed then tried out in the pilot study and, where necessary, revised.

The two sets of tests (for pupils and teachers) were calibrated so as to be on the same scale. For the pupil tests there was also the wish to be able to compare reading scores with the IEA Reading Literacy study and mathematics scores with the IEA's Third International Mathematics and Science Study (TIMSS). Hence there had to be common items with these tests from the other studies. The selection of teacher test items had to cover the full range of pupil item difficulties –

but did not contain too many easy pupil test items. In addition, in order not to antagonize teachers with an extended testing session, the teacher tests had a much smaller number of test items than the pupil tests.

Where English was not the medium of instruction, it was necessary to translate the SACMEQ II tests, questionnaires, and manuals into local languages. Tanzania and Zanzibar translated the materials into Kiswahili while Mozambique translated the materials into Portuguese. In order to ensure high quality translations for the reading and mathematics tests, each item was translated into the local language and then back translated. The back translations were compared with the original (English) versions of the tests in order to check for omissions, additions, unwanted changes in meaning, or other problems.

The reading tests

“Reading literacy” was defined as “the ability to understand and use those written language forms required by society and/or valued by the individual.” Three broad content domains for reading literacy were agreed as providing a balanced coverage of the main reading domains and the required reading skills. The definition and the domains had been used in SACMEQ I and also in the International Reading Literacy Study.

The three broad content domains for reading literacy were:

Narrative prose: Continuous texts in which the writer aims to tell a story – whether this be fact or fiction.

Expository prose: Continuous text in which the writer aims to describe, explain, or otherwise convey factual information or opinion to the reader.

Documents: Structured information organized by the writer in a manner that requires the reader to search, locate, and process selected facts, rather than to read every word of a continuous text.

At the same time a hierarchy of skills was proposed (a dimension of increasing competence) that could be applied to both of the SACMEQ studies. A blueprint of the test in terms of items and domains by hierarchy has been presented in Appendix 2.2. In the final version of the SACMEQ

II reading test there was a total of 83 test items, with (a) 32, 26, and 25 items allocated to the narrative, expository, and documents domains, respectively; and (b) 6, 22, 26, 18, and 11 items set at skill levels 1 to 5, respectively.

Mathematics test

For mathematics a similar exercise was undertaken except this time there had been no SACMEQ I test in mathematics. The resultant domains were:

Number: Operations and number line, square roots, rounding and place value, significant figures, fractions, percentages, and ratios.

Measurement: Measurements related to distance, length, area, capacity, money, and time.

Space-Data: Geometric shapes, charts (bar, pie, and line), and tables of data.

The proposed blueprint with levels and items had been presented in Appendix 2.3.

In the final version of the SACMEQ II pupil mathematics test there was a total of 63 test items, with 27, 18, and 18 items allocated to the number, measurement, and space-data domains, respectively, and 6, 20, 17, 12, and 8 items set at mathematics skill levels 1 to 5 respectively.

When the NRCs had completed the reading and mathematics test blueprints, they worked in teams to either select or write all of the required test items for the SACMEQ II tests. The prepared items were classified according to the cells in the test blueprints. For each cell *twice* as many items as required were prepared so that the rejection of poor items after the trial testing did not result in a shortage of items in some cells. Most test items were in multiple-choice format with four options per item. The item pools were then sent to all countries for review by panels of curriculum specialists. This resulted in editorial changes to the items and recommendations for additional items by the panel members who made sure that the items met the requirements of the respective national curricula.

The main challenge in the construction of the reading and mathematics tests for teachers was to “fine-tune” the difficulty range of test items so that it would suit the higher levels of competence that were expected of teachers. At the same time it was important to ensure that there was sufficient

“item overlap” with the pupil tests to permit the performance of teachers and pupils to be measured on the same scale.

In the reading test for teachers, several passages were selected because of the more subtle nature of the messages that they conveyed, and the less-visible underlying assumptions of the writers. For example, one passage on the topic of “smoking” required the teachers to identify the unstated values and beliefs of the writer. Another passage on the topic of “effective thinking” required the teachers to identify assumptions made by the writer about the readers and their knowledge of the topic. These kinds of skills were far beyond the competencies that had been identified from the analyses of Standard 6 curricula.

The “extra” reading and mathematics items for teachers were expected to assess the higher competence levels of teachers – but not to be so difficult that the teachers would be daunted by the challenge. In addition, the selection of easier test items that “overlapped” with the pupil tests had to be made with extreme care because the teachers may have felt insulted if these items were ridiculously easy or if they were concerned with issues that would only interest young children.

In the teacher reading test the extended levels of competence mainly focused on expository texts – rather than on documents or narratives. It was felt that the use of narratives and documents at this level would have required very complex and long texts that would have generally extended the time required to complete the test.

In the teacher mathematics test the extended levels of competence mainly emphasized problem solving strategies that required the extraction of information from verbal, graphic, or tabular presentations. For these items, the teachers were expected to follow three steps: to identify the nature of the problem, to transform the problem into mathematical language, and to solve the problem. In some cases this required the rearrangement of information, and in others it meant translating the problem into one or more equations and then solving the equations.

The tests and questionnaires were piloted in all countries. In Tanzania the pilot study was conducted in 30 schools selected from Dar es Salaam and Pwani regions comprising 600 pupils and 50 teachers. The pilot study took place in September 1999. The pilot study also provided an opportunity

for the training of the first 12 data collection team leaders, who took part in the main study by training data collectors and overseeing the data collection exercise at school level during the first week of December 2000. The data were returned to a central data processing centre at IIEP in Paris.

Three kinds of scores

It was decided to derive and use three kinds of scores from the tests. These have been described below.

The calculation of scale scores (Rasch)

The data from the trial-testing phase were subjected to Rasch and Classical item analyses in order to detect items that did not “fit” the relevant scales, or that were “behaving differently” across subgroups of respondents defined by gender and country. The poor quality test items were rejected – keeping in mind the need to prepare a “balanced” test across skill levels and domains. The Rasch and classical item analyses were also undertaken a second time after the main testing.

In the case of the measurement of reading performance, there were three groups of respondents: the SACMEQ I pupils, the SACMEQ II pupils, and the SACMEQ II teachers. Each group completed a reading test that was “different but overlapped”. That is, each group completed a reading test that contained some unique test items and some items that also appeared on one or the other tests. In the case of numeracy measurement, the tests were also “different but overlapped”, however there were only two groups of respondents: the SACMEQ II pupils and SACMEQ II teachers.

Although data were gathered at different time points for the SACMEQ I (1995-1997) and SACMEQ II (2000-2002) projects, it is possible to think of the reading and mathematics tests used in the projects as two “artificial” or “composite” tests of 148 different reading items and 91 mathematics items, respectively. This conceptualisation of the tests implies that the three sets of reading test respondents and the two sets of mathematics test respondents can each represent a single group of respondents for the purposes of undertaking “concurrent” scaling of the tests using the Rasch Model.

For the 148-item “composite” reading test described in Figure 2.10 there were 36 items that came only from the SACMEQ I pupil reading test, 52 test items that came only from the SACMEQ II pupil reading test, and 26 items that came only from the SACMEQ II teacher reading test. An additional 34 items were located in more than one test, with 9 of these items being located in all three tests, and 3 sets of items associated with pairs of tests. For the 91-item “composite” mathematics test described in Figure 2.11 there were 50 items that came only from the SACMEQ II pupil mathematics test, and 28 items that came only from the SACMEQ II teacher mathematics test. An additional 13 items were located in both tests.

Both the reading and mathematics data matrices were analysed using computer software that applied the Rasch Model of measurement (Andrich and Luo, 2000). The first step was to calibrate the test items by calculating the Rasch difficulty values for each item within the 148-item reading test and the 91-item mathematics test. The results of the calibration were then used to calculate reading and mathematics scores for all pupils and teachers in all countries.

In each of the SACMEQ countries the Ministry specialists were asked to identify those items that were in the curriculum. These items were named ‘essential’ items and formed a subset of all the items in the test. To provide a fair comparison of all countries on the total test score the correlations between the ‘essential’ items and all items were calculated in every country and in all cases the results were between 0.98 and 1.00. In Tanzania the correlation between the ‘essential’ items and all items was .99. This is proof that the tests were valid for Tanzania and also for other countries.

The mean for all SACMEQ countries was set at 500 and the standard deviation at 100. Against this mean, the pupils mean score for Tanzania in the reading test was 545.9 implying that Tanzania pupils scored above the SACMEQ mean in the test.

The identification of ‘derived’ skill competence levels

For each set of tests (pupil and teacher for reading and pupil and teacher for mathematics) the items were first arranged in order of difficulty, and then examined item-by-item in order to describe the

specific skills required to provide correct responses. When items had been linked to specific skills, they were placed into groups or clusters of test items such that the items in each group had similar difficulty values and shared a common “theme” with respect to the underpinning competencies required to provide correct responses.

The three tasks of defining specific skills for each test item, identifying groups of items with similar difficulties, and then naming the “theme” (or competency level) linked to each group were extremely difficult because it required the NRCs to first reach agreement on how the respondents arrived at correct solutions, and to then name the competency required. This required the NRCs to use their practical knowledge of the ways in which pupils solve problems, and then to portray this with a meaningful description of the thought processes that had been applied. The skills audit for the reading and mathematics tests resulted in the identification of eight levels of competence for each test. This was more than had been proposed in the test blueprints. For both tests there was a strong correspondence between the descriptions of the five blueprint levels and most of the derived levels arising from the skills audit – which suggested that the three “extra” levels were defining more detail on the same reading and mathematics scales.

The skill levels *with examples of items* characterising each level have been presented in detail in Appendix 2.4.

An abbreviated version has been presented in Table 2.1. It will be seen that the levels are hierarchical. It is then possible to calculate the percentage of pupils reaching any one level. These have been presented in Chapter 7 in this report and they can be regarded as being more meaningful than other scores because the competency levels indicate exactly what pupils can and cannot do.

Table 2.1: The final skill levels for the SACMEQ reading and mathematics tests

Level	Reading	Mathematics
1	<i>Pre-reading:</i> Matches words and pictures involving concrete concepts and everyday objects. Follows short simple written instructions	<i>Pre-numeracy:</i> Applies single step addition or subtraction operations. Recognises simple shapes. Matches numbers and pictures. Counts in whole numbers.
2	<i>Emergent reading:</i> Matches words and pictures involving prepositions and abstract concepts; uses cuing systems (t sounding out, using simple sentence structure, and familiar words) to interpret phrases by reading on.	<i>Emergent numeracy:</i> Applies a two-step addition or subtraction operation involving carrying, checking (through very basic estimation), or conversion of pictures to numbers. Estimates the length of familiar objects. Recognises common two-dimensional shape
3	<i>Basic reading:</i> Interprets meaning (by matching words and phrases, completing a sentence, or matching adjacent words in a short and simple text by reading on or reading back.	<i>Basic numeracy:</i> Translates verbal information presented in a sentence, simple graph or table, using one arithmetic operation in several repeated steps. Translates graphical information into fractions. Interprets place value of whole numbers up to thousands. Interprets simple common everyday units measurement.
4	<i>Reading for meaning:</i> Reads on or reads back in order to link and interpret information located in various parts of text.	<i>Beginning numeracy:</i> Translates verbal or graphic information into simple arithmetic problems. Uses multiple different arithmetic operations (in the correct order) on whole numbers, fractions, and/or decimals.
5	<i>Interpretive reading:</i> reads on and reads back in order to combine and interpret information from various parts of the text in association with external information (based on recalled factual knowledge) that ‘completes’ and contextualizes meaning	<i>Competent numeracy:</i> Translates verbal, graphic, or tabular information into an arithmetic form in order to solve a given problem. Solves multiple-operation problems (using the correct order of arithmetic operations) involving everyday units of measurement and/or whole and mixed numbers. Converts basic measurement units from one level of measurement to another (for example, metres to centimetres)
6	<i>Inferential reading:</i> Reads on and reads back through longer texts (narrative, document, or expository) in order to combine information from various parts of the text so as to infer the writer’s purpose.	<i>Mathematically skilled:</i> Solves multiple-operation problems (using the correct order of arithmetic operations) involving fractions, ratios, and decimals. Translates verbal and graphic representation information into symbolic, algebraic, and equation form in order to solve a given mathematical problem. Checks and estimates answers using external knowledge (not provided within the problem).

7	<i>Analytical reading:</i> Locates information in longer texts (narrative, document, or expository) by reading on and reading backing order to combine information from various parts of the text so as to infer the writer's personal beliefs (values, systems, prejudices, and/or biases).	<i>Problem solving:</i> Extracts and converts (for example with respect to measurement units) information from tables, charts, visual and symbolic presentations in order to identify, and then solve multi-step problems.
8	<i>Critical reading:</i> Locates information in longer texts (narrative, document, and expository) by reading on and reading back in order to combine information from various parts of the text so as to infer and evaluate what the writer has assumed about the topic and the characteristics of the reader – such as age, knowledge, and personal beliefs (values, systems, prejudices, and/or biases)	<i>Abstract Problem Solving:</i> Identifies the nature of an unstated mathematical problem embedded within verbal or graphic information, and then translate this into symbolic, algebraic, or equation form in order to solve the problem.

The specification of minimum and desirable levels of reading

Ministries of Education established national committees which comprised relevant education experts to specify minimum and desirable levels of reading. For Tanzania the committee included school inspectors, experienced teachers, and curriculum developers. The committees were asked to identify the reading and mathematics performances that they would expect from a pupil who (a) would *barely survive* during the next year of schooling (the “Minimum” level), and (b) was *guaranteed to succeed* during the next year of schooling (the “Desirable” level). This step was vital since it was allowing the national experts to establish their own national standards of the pupil performance in the test items prior to the collection of data.

Sampling

The “best” sample design for a particular project is one that provides levels of sampling accuracy that are acceptable in terms of the main aims of the project, while simultaneously limiting cost, logistic, and procedural demands to manageable levels. The major constraints that were established prior to the preparation of the sample designs for the SACMEQ II Project have been listed below.

Target Population: The target population definitions should focus on Standard 6 pupils attending registered mainstream government or non-government schools. In addition, the defined target population should be constructed by excluding no more than 5 percent of pupils from the desired target population.

Bias Control: The sampling should conform to the accepted rules of scientific probability sampling. That is, the members of the defined target population should have a known and non-zero probability of selection into the sample so that any potential for bias in sample estimates due to variations from “epsem sampling” (equal probability of selection method) could be addressed through the use of appropriate sampling weights.

Sampling Errors: The sample estimates for the main criterion variables should conform to the sampling accuracy requirements that the standard error of sampling for the pupil tests should be of a magnitude that is equal to, or smaller than, what would be achieved by employing a simple random sample of 400 pupils.

Response Rates: Each SACMEQ country should aim to achieve an overall response rate for pupils of 80 percent. This figure was based on the wish to achieve or exceed a response rate of 90 percent for schools and a response rate of 90 percent for pupils within schools.

Administrative and Financial Costs: The number of schools selected in each country should recognize limitations in the administrative and financial resources available for data collection.

Other Constraints: The number of pupils selected to participate in the data collection in each selected school should be set at a level that will maximize validity of the within-school data collection for the pupil reading and mathematics tests.

The Specification of the Target Population

For Tanzania the *desired* target population was all pupils enrolled in Standard 6 in the ninth month of the school year (i.e., in the first week of December 2000). A decision was made to exclude pupils in special schools and those in schools which had fewer than 20 Standard 6 pupils which led to the establishment of the *defined* target population. In Table 2.2 the desired, defined and excluded Grade 6 population for Tanzania has been presented.

Table 2.2. The desired, defined and excluded Grade 6 population for Tanzania.

Stratum (zone)	Desired		Defined			Excluded		
	Schools	Pupils	Schools	Pupils	Schools	Pupils		
	No.	No.	No.	No.	%	No.	%	
Central	869	44911	811	44076	58	7%	835	2%
Eastern	530	50273	421	48815	109	21%	1458	3%
Kagera	529	19635	481	18920	48	9%	715	4%
Kilimanjaro	699	35429	662	34882	37	5%	547	2%
Mwanza	848	41212	800	40460	48	6%	752	2%
North East	1287	54658	1100	52053	187	15%	2605	5%
Northern	1135	65574	1060	64440	75	7%	1134	2%
South Western	605	31827	510	30537	95	16%	1290	4%
Southern	1319	55203	1056	51552	263	20%	3651	7%
Southern Highlands	1541	72650	1373	70331	168	11%	2319	3%
Western	1424	57924	1242	55288	182	13%	2636	5%
Tanzania	10786	529296	9516	511354	1270	12%	17942	3%

Tanzania there were 10,786 schools having 529,296 Standard 6 pupils. The excluded population was 17,942 pupils from 1,270 schools which was 3.3 percent of all pupils. The defined population from which a sample had to be drawn consisted of 511,354 pupils from 9,516 schools.

The number of schools required in the sample is in part a function of the intra-class correlation (ρ) which is an indicator of the variation (in achievement in this case) among schools as a proportion of total variation. The following is the formula often used for estimating the value of ρ in situations where two-stage cluster sampling is employed using (approximately) equal sized clusters).

$$\text{estimated rho} = (b \cdot s(a)^2 - s^2) / (b - 1)s^2$$

where $s(a)^2$ is the variance of cluster means, s^2 is the variance of the element values, and b is the cluster size.. For Tanzania a rho of 0.4 was used. This meant drawing a sample of 185 schools.

The numbers of schools and pupils in the planned and achieved samples have been presented in Table 2.3. The sample was stratified into zones and the number of schools required for each region. The actual number of schools was 181. In all 77.1 percent of the planned number of pupils were in the final sample and 98.0 percent of the schools. Two schools had no Standard 6 pupils and two others could not be reached due to floods and absenteeism by some pupils during data collection period resulted into the achieved sample. However, sampling weights were used to correct for disproportionality among strata in the calculation of all statistics.

It will be recalled that the major aim of the sampling was to have the equivalent of a simple random sample of 400 pupils. In Tanzania this was 321 for reading achievement and 423 for mathematics and the rhos values were 0.60 for reading and 0.53 for mathematics.

Table 2.3. Number of schools and pupils in the planned and achieved samples

Region	Planned		Achieved		Response rate	
	Schools	Pupils	Schools	Pupils	Schools	Pupils
Central	15	300	15	245	100%	82%
Eastern	15	300	15	186	100%	62%
Kagera	15	300	15	231	100%	77%
Kilimanjaro	15	300	15	235	100%	78%
Mwanza	15	300	15	226	100%	75%
North-east	15	300	15	196	100%	65%
Northern	20	400	20	306	100%	77%
South-highlands	25	500	25	478	100%	96%
Southern	15	300	12	196	80%	65%
South West	15	300	14	243	93%	81%
Western	20	400	20	312	100%	78%
Tanzania	185	3700	181	2854	98%	77%

Throughout the report wherever a percentage or mean has been presented the accompanying sampling error has been presented. This has been explained at the beginning of Chapter 3.

The main data collection

The main data collection took place during the first week of December 2000. The local authorities and schools were notified about the data collection several weeks in advance. The data collection training manual used by the data collectors contained detailed instructions concerning the random selection of 20 sample pupils and all necessary steps that data collectors had to follow when at a school, packaging and returning the instruments to the 5 centres. A team of 15 data collectors (who had participated in the pilot study) was trained at the Ministry head office in Dar es Salaam) in September 2000. These, in turn, trained 92 data collectors nationwide in 5 centres namely: Kibaha, Dodoma, Moshi, Mbeya, Mwanza to ensure uniformity in data collection throughout the country. The training of 92 data collectors included a simulated data collection within the groups. The experiences gathered during these exercises were shared and discussed among trainees during a later meeting so that all data collectors understood the procedures to be completed within schools.

At the school, they ensured a testing room with 20 well-placed sitting and writing places was available and that the data were collected on two consecutive days. Data collectors with the collaboration of the head teacher ensured that a well ventilated and light room with enough sitting and writing places for 20 pupils, class registers were available and that the selected the learners were present.

On the first day, data collectors administered the pupil questionnaire, reading test, school head questionnaire, teacher questionnaire and teacher reading test. During the evening of the first day data collectors' checked all the information collected and then, where necessary, obtained any missing or incomplete information on the second day.

Data entry and data cleaning

Six persons from the National Examination Council of Tanzania (NECTA) and MOEC were appointed and trained in the use of WINDEM, a special data entry package to be used in SACMEQ. NECTA and MOEC computers were used for Data entry and data cleaning. The process was facilitated by written instructions and follow- up support from IIEP staff in the basic steps mainly via the internet and permitted the NRCs to:

- (i) identify major errors in the sequence of identification numbers,
- (ii) cross-check identification numbers across files (for example, to ensure that all pupils were linked with their own reading and mathematics teachers),
- (iii) ensure that all schools listed on the original sampling frame also had valid data collection instruments and vice-versa,
- (iv) check for “wild codes” that occurred when some variables had values that fell outside pre-specified reasonable limits, and validate that variables used as linkage devices in later file merges were available and accurate.

The volume of information required to be entered and cleaned in the code sheets was immense despite the user friendliness of the software thus perseverance and experience of keyboard operation was required. The following can help one imagine the volume of work entered. Data collection

instruments contained the follows information to be coded: school form: 58; pupil name form: 51; pupil questionnaire: 150; pupil reading test: 85; pupil mathematics test: 65; teacher questionnaire: 587; teacher reading test: 51; teacher mathematics test: 43; and school head questionnaire: 319. All the data entered were sent to the IIEP for checking in order to ensure that there were no errors such as inconsistencies or wild values. The IIEP then sent back the data to Tanzania for cleaning, after which the Ministry sent it back to IIEP for further checks. This process continued until the data was absolutely clean, and it took 21 months to complete (March 2001 and November 2002).

Merging, weighting, and the statistical analyses

Merging. The merging process required the construction of a single data file for each school system in which pupils were the units of analysis. This was achieved by “disaggregating” the teacher and school head data over the pupil data. That is, each record of the final data file for consisted of the following four components: (a) the questionnaire and test data for an individual pupil, (b) the questionnaire and test data for his/her mathematics and reading teacher, (c) the questionnaire data for his/her school head, and (d) school and pupil “tracking forms” that were required for data cleaning purposes.

The merged file enabled linkages to be made among pupils, teachers, and school heads at the “between-pupil” level of analysis. To illustrate, with the merged file it was possible to examine questions of the following kind: “What are the average reading and mathematics test scores (based on information taken from the pupil tests) for groups of pupils who attend urban or rural schools (based on information taken from the school head questionnaire), and who are taught by male or female teachers (based on information taken from the teacher questionnaire)?”

Weighting. The calculation of sampling weights “raising factors” was conducted after all files had been cleaned and merged. Sampling weights were used to adjust for missing data and for variations in probabilities of selection that arose from the application of stratified multi-stage sample designs. There were also certain country-specific aspects of the sampling procedures, and these had to be reflected in the calculation of sampling weights.

Two forms of sampling weights were prepared for the SACMEQ II Project. The first sampling weight (RF2) was the inverse of the probability of selecting a pupil into the sample. These “raising factors” were equal to the number of pupils in the defined target population that were “represented by a single pupil” in the sample. The second sampling weight (pweight2) was obtained by multiplying the raising factors by a constant so that the sum of the sampling weights was equal to the achieved sample size.

Statistical analyses

Rasch scaling procedures. A particularly innovative aspect of the SACMEQ II Project was its approach to presenting the literacy and numeracy performance of pupils in a manner that provided descriptive accounts of increasing levels of competence. This was made possible through the use of the Rasch scaling procedures - which permitted, for each test, the performance of pupils to be aligned along a single dimension that could be broken into groups or levels – each being named according to the skills required to successfully complete the items within each group. Four main steps were used in the SACMEQ II Project to define levels of competence:

First, the Rasch Item Response Theory was used to establish the difficulty value for each test item. Second, the NRCs subjected each test item to an intensive “skills audit” (in order to identify the required problem-solving mechanisms for each item “through a Grade 6 pupil’s eyes”). Third, the items were clustered into eight groups or “levels” that had similar difficulties and that required similar skills. Finally, the NRCs wrote descriptive accounts of the competencies associated with each cluster of test items by using terminology that was familiar to ordinary classroom teachers.

This method of defining reading and mathematics performance moved far beyond the traditional approach of assigning scores based on the number of correct test items. The traditional approach to describing test performance is of limited use concerning the identification of specific strategies that can be understood by teachers who would like to plan either remediation programmes or performance improvement for their pupils. In contrast, the levels of competence approach provide meaningful descriptive information about the tasks that pupils can currently

manage, and the knowledge and skills that pupils require if they are to move to higher levels of competence.

The work undertaken to define the descriptive levels of competence that the scaling of test scores using the Rasch technique required all countries to have completed their data cleaning. When all data were available, it was possible to transform the Rasch scores to an international mean and standard deviation of 500 and 100, respectively. These two figures were established by using a special sampling weight that treated the samples in each country as if they were the same size.

Analyzing the data

The data analyses for the SACMEQ II Project were very clearly defined because they were focussed specifically on generating results that could be used to “fill in the blank entries” in the dummy tables described above. The SPSS software system was first used to construct new variables (often referred to as “indices”) or to recode existing variables. For example, an index of “socioeconomic level” was constructed by combining recoded variables that described the educational level of the pupils’ parents, the materials used in the construction of pupils’ homes, and the number of possessions in pupils’ homes. Second, the IIEP’s specialized data analysis software, IIEPJACK, was used to “fill” the Dummy Tables with appropriate statistics along with their correct measures of sampling error.

Conclusion

The focus of this chapter was to provide a description of the procedures that were applied to conduct SACMEQ II research project in Tanzania. This covered explanations of the main phases of the research, the sample design procedures, and the construction of the reading and mathematics tests for pupils and their teachers. A description was given of the consultative process of key decision-makers in Ministries of Education concerning their “General Policy Concerns” which were then collated across countries, grouped into five themes, and used as a foundation for the design of the whole data collection and the research reporting procedures. A description has been presented on sampling, covering a detailed description of the steps involved

in the design of the samples, the selection of the samples, and the construction of sampling weights. Information has been presented on the “evaluation” of the SACMEQ II sampling procedures in terms of the calculation of response rates, design effects, effective sample sizes, and standard errors of sampling. One of the important messages that emerged was that the speed at which a cross-national research project proceeds is strongly influenced by the speed with which the slowest country can complete all aspects of its data collection and data preparation.

A shift of SACMEQ II Project towards the use of Modern Item Response Theory to generate descriptions of “levels of increasing pupil competence from traditional approaches to the calculation of test scores (based on numbers of correct responses to test items)” has been underlined. This approach (Modern Item Response Theory) to describing pupil reading and mathematics achievement offered a mechanism for describing the performance of pupils in a manner that was operationally more useful in guiding teaching and learning.

In chapters 3 to 7 the results of data analyses have been presented and interpretations made in order to see the policy implications before an agenda for action was presented in Chapter 8.

Appendix 2.1: General Policy concerns for SACMEQ II study

Theme A: Pupils' Characteristics and Their Learning Environments

General Policy Concern 1: What were the personal characteristics (for example, age and gender) and home background characteristics (for example, parent education, regularity of meals, home language, etc.) of Standard 6 pupils that might have implications for monitoring equity, and/or that might impact upon teaching and learning?

General Policy Concern 2: What were the school context factors experienced by Standard 6 pupils (such as location, absenteeism (regularity and reasons), standard repetition, and homework (frequency, amount, correction, and family involvement)) that might impact upon teaching/learning and the general functioning of schools?

General Policy Concern 3: Did Standard 6 pupils have sufficient access to classroom materials (for example, textbooks, readers, and stationery) in order to participate fully in their lessons?

General Policy Concern 4: Did Standard 6 pupils have access to library books within their schools, and (if they did have access) was the use of these books being maximized by allowing pupils to take them home to read?

General Policy Concern 5: Has the practice of Standard 6 pupils receiving extra lessons in school subjects outside school hours become widespread, and have these been paid lessons?

Theme B: Teachers' Characteristics and their Viewpoints on Teaching, Classroom Resources, Professional Support, and Job Satisfaction

General Policy Concern 6: What were the personal characteristics of Standard 6 teachers (for example, age, gender, and socio-economic level), and what was the condition of their housing?

General Policy Concern 7: What were the professional characteristics of Standard 6 teachers (in terms of academic, professional, and in-service training), and did they consider in-service training to be effective in improving their teaching?

General Policy Concern 8: How did Standard 6 teachers allocate their time among responsibilities concerned with teaching, preparing lessons, and marking?

General Policy Concern 9: What were Standard 6 teachers' viewpoints on (a) pupil activities within the classroom (for example, reading aloud, pronouncing, etc.), (b) teaching goals (for example, making learning enjoyable, word attack skills, etc.), (c) teaching approaches/strategies (for example, questioning, whole class teaching, etc.), (d) assessment procedures, and (e) meeting and communicating with parents?

General Policy Concern 10: What was the availability of classroom furniture (for example, sitting/writing places, teacher table, teacher chair, and bookshelves) and classroom equipment (for example, chalkboard, dictionary, maps, book corner, and teacher guides) in Standard 6 classrooms?

General Policy Concern 11: What professional support (in terms of education resource centres, inspections, advisory visits, and school head inputs) was given to Standard 6 teachers?

General Policy Concern 12: What factors had most impact upon teacher job satisfaction?

Theme C: *School Heads' Characteristics and their Viewpoints on Educational Infrastructure, the Organization and Operation of Schools, and Problems with Pupils and Staff*

General Policy Concern 13: What were the personal characteristics of school heads (for example, age and gender)?

General Policy Concern 14: What were the professional characteristics of school heads (in terms of academic, professional, experience, and specialized training)?

General Policy Concern 15: What were the school heads' viewpoints on general school infrastructure (for example, electrical and other equipment, water, and basic sanitation) and the condition of school buildings?

General Policy Concern 16: What were the school heads' viewpoints on (a) daily activities (for example, teaching, school-community relations, and monitoring pupil progress), (b) organizational policies (for example school magazine, open days, and formal debates), (c) inspections, (d) community input, (e) problems with pupils and staff (for example, pupil lateness, teacher absenteeism, and lost days of school)?

Theme D: Equity in the Allocation of Human and Material Resources Among Regions and Among Schools Within Regions

General Policy Concern 17: Have human resources (for example, qualified and experienced teachers and school heads) been allocated in an equitable fashion among regions and among schools within regions?

General Policy Concern 18: Have material resources (for example, classroom teaching materials and school facilities) been allocated in an equitable fashion among regions and among schools within regions?

Theme E: *The Reading and Mathematics Achievement Levels of Pupils and Their Teachers*

General Policy Concern 19: What were the levels (according to descriptive levels of competence) and variations (among schools and regions) in the achievement levels of Standard 6 pupils and their teachers in reading and mathematics – for my country and for all other SACMEQ countries?

General Policy Concern 20: What were the reading and mathematics achievement levels of important sub-groups of Standard 6 pupils and their teachers (for example, pupils and teachers of different genders, socio-economic levels, and locations)?

Appendix 2.2 Test Blueprint for SACMEQ II Reading Test

	Narrative	Expository	Documents	
Level 1	Word/picture association involving positional or directional prepositions requiring the linkage of a picture to a position or a direction in order to answer the question	Word/picture association involving positional or directional prepositions requiring the linkage of a picture to a position or a direction in order to answer the question	Word/picture association involving positional or directional prepositions requiring the linkage of a picture to a position or a direction in order to answer the question	
Items	2	2	2	6
Level 2	Recognizing the meaning of a single word and being able to express it as a synonym in order to answer the question	Recognizing the meaning of a single word and being able to express it as a synonym in order to answer the question	Linking simple piece of information to item or instruction	
Items	7	6	9	22
Level 3	Linking information portrayed in sequences of ideas and content, when reading forward	Linking information portrayed in sequences of ideas and content, when reading forward	Systematic search for information when reading forward	
Items	8	10	8	26
Level 4	Seeking and confirming information when reading backwards through text	Seeking and confirming information when reading backwards through text	Linking more than one piece of information in different parts of a document	
Items	9	5	4	18
Level 5	Linking ideas from different parts of text. Making inferences from text or beyond text, to infer author's values and beliefs	Linking ideas from different parts of text. Making inferences from text or beyond text.	Use of embedded lists and even subtle advertisements where the message is not explicitly stated	
Items	6	3	2	11
Total Items	32	26	25	83

Appendix 2.3: SACMEQ II mathematics test blueprint

Skill Level	Mathematics Domain			
	Number	Measurement	Space-Data	
Level 1	Recognize numbers. Link patterns to numbers.			
Items	6	0	0	6
Level 2	Apply single operations to two digit numbers or simple fractions.	Recognize units of measurement. Apply basic calculations using simple measurement units.	Link patterns and graphs to single digits. Recognize and name basic shapes.	
Items	8	8	4	20
Level 3	Extend and complete number patterns.	Convert measurement units when undertaking one-step operations.	Translate shapes and patterns. Identify data in tabular form.	
Items	6	4	7	17
Level 4	Combine arithmetic operations in order to link information from tables and charts when performing calculations.	Apply two and three-step arithmetic operations to numbers. Use and convert measurement units.	Combine arithmetic operations in order to link information from tables and charts.	
Items	4	4	4	12
Level 5	Combine operations in order to make calculations involving several steps and a mixture of operations using combinations of fractions, decimals, and whole numbers.	Combine operations in order to make calculations involving several steps and a mixture of operations using a translation of units.	Link data from tables and graphs in order to make calculations involving several steps and a mixture of operations.	
Items	3	2	3	8
Total Items	27	18	18	63

Appendix 2.4: Skill competence levels for Reading and Mathematics

Reading

Level 1: Pre Reading (Linked with Level 1 in the Test Blueprint)

(a) Skills: Matches words and pictures involving concrete concepts and everyday objects. Follows short simple written instructions.

(b) Example Test Items

- locate familiar words in a short (one line) text
- match words to pictures
- follow short and familiar instructions

Level 2: Emergent Reading (Linked with Level 2 in the Test Blueprint)

(a) Skills: Matches words and pictures involving prepositions and abstract concepts; uses cuing systems (by sounding out, using simple sentence structure, and familiar words) to interpret phrases by reading on.

(b) Example Test Items

- read familiar words and identify some new words
- use simple and familiar prepositions and verbs to interpret new words
- match words and very simple phrases

Level 3: Basic Reading (Linked with Level 3 in the Test Blueprint)

(a) Skills: Interprets meaning (by matching words and phrases, completing a sentence, or matching adjacent words) in a short and simple text by reading on or reading back.

(b) Example Test Items

- use context and simple sentence structure to match words and short phrases
- use phrases within sentences as units of meaning
- locate adjacent words and information in a sentence

Level 4: Reading for Meaning (Linked with Level 4 in the Test Blueprint)

(a) Skills: Reads on or reads back in order to link and interpret information located in various parts of the text.

(b) Example Test Items

- interpret sentence and paragraph level texts
- match phrases across sentences
- read forwards and backwards in order to locate information in longer texts

Level 5: Interpretive Reading (Linked with Level 5 in the Test Blueprint)

(a) Skills: Reads on and reads back in order to combine and interpret information from various parts of the text in association with external information (based on recalled factual knowledge) that “completes” and contextualizes meaning.

(b) Example Test Items

- locate, interpret, and read forward to join two pieces of adjacent information
- use multiple pieces of information to interpret general purpose of a document
- paraphrase and interpret a single non-adjacent piece of information

Level 6: Inferential Reading (Linked with Level 5 in the Test Blueprint)

(a) Skills: Reads on and reads back through longer texts (narrative, document or expository) in order to combine information from various parts of the text so as to infer the writer’s purpose.

(b) Example Test Items

- interpret, and make inferences from, different types of texts by reading backwards and forwards to confirm links between widely separated information pieces
- extract information from a non-traditional (left to right) document
- make judgments about an author's intentions or purpose beyond the text content

Level 7: Analytical Reading (Linked with Level 5 in the Test Blueprint)

(a) Skills: Locates information in longer texts (narrative, document or expository) by reading on and reading back in order to combine information from various parts of the text so as to infer the writer’s personal beliefs (value systems, prejudices, and/or biases).

(b) Example Test Items

- combine several pieces of information from a range of locations in complex and lexically dense text or documents
- analyse detailed text or extended documents for an underlying message
- identify meaning from different styles of writing

Level 8: Critical Reading (A New Level Generated from the Skills Audit)

(a) Skills: Locates information in a longer texts (narrative, document or expository) by reading on and reading back in order to combine information from various parts of the text so as to infer and evaluate what the writer has assumed about both the topic and the characteristics of the reader – such as age, knowledge, and personal beliefs (value systems, prejudices, and/or biases).

(b) Example Test Items

- use text structure and organisation to identify an author's assumptions and purposes
 - identify an author's motives, biases, beliefs in order to understand the main theme
 - link text to establish multiple meanings including analogy and allegory
-

Mathematics

Level 2: Emergent Numeracy (Linked with Level 1 in the Test Blueprint)

(a) Skills: Applies a two-step addition or subtraction operation involving carrying, checking (through very basic estimation), or conversion of pictures to numbers. Estimates the length of familiar objects. Recognizes common two-dimensional shapes.

(b) Example Test Items

- count illustrated objects
- recognise basic numbers and shapes
- carry out simple single operations of addition and subtraction

Level 2: Emergent Numeracy (Linked with Level 1 in the Test Blueprint)

(a) Skills: Applies a two-step addition or subtraction operation involving carrying, checking (through very basic estimation), or conversion of pictures to numbers. Estimates the length of familiar objects. Recognizes common two-dimensional shapes.

(b) Example Test Items

- link simple verbal, graphic, and number forms with single arithmetic operations on whole numbers up to two digits
- recognise common shapes or figures in two dimensions
- estimate accurately lengths of simple shapes

Level 3: Basic Numeracy (Linked with Level 2 in the Test Blueprint)

(a) Skills: Translates verbal information presented in a sentence, simple graph or table using one arithmetic operation in several repeated steps. Translates graphical information into fractions. Interprets place value of whole numbers up to thousands. Interprets simple common everyday units of measurement.

(b) Example Test Items

- recognise three-dimensional shapes and number units
- use a single arithmetic operation in two or more steps
- convert in single step units using division

Level 4: Beginning Numeracy (Linked with Level 3 in the Test Blueprint)

(a) Skills: Translates verbal or graphic information into simple arithmetic problems. Uses multiple different arithmetic operations (in the correct order) on whole numbers, fractions, and/or decimals.

(b) Example Test Items

- convert units in two steps and count tabulated data
- analyse a visual prompt and interpret triangular shapes
- translate verbal to arithmetic form using two operations on fractions

Level 5: Competent Numeracy (Linked with Level 3 in the Test Blueprint)

(a) Skills: Translates verbal, graphic, or tabular information into an arithmetic form in order to solve a given problem. Solves multiple-operation problems (using the correct order of arithmetic operations) involving everyday units of measurement and/or whole and mixed numbers. Converts basic measurement units from one level of measurement to another (for example, metres to centimetres).

(b) Example Test Items

- convert basic measurement units
- understand the order of magnitude of simple fractions
- conduct multiple steps with a range of basic operations in a strict sequence using an analysis of a short verbal or visual prompt

Level 6: Mathematically Skilled (Linked with Level 4 in the Test Blueprint)

(a) Skills: Solves multiple-operation problems (using the correct order of arithmetic operations) involving fractions, ratios, and decimals. Translates verbal and graphic representation information into symbolic, algebraic, and equation form in order to solve a given mathematical problem. Checks and estimates answers using external knowledge (not provided within the problem).

(b) Example Test Items

- perform complex and detailed mathematical tasks (involving considerable abstraction of verbal, visual, and tabular information into symbolic forms and algebraic solutions) using knowledge not supplied with the task
- use of an extended verbal or graphic prompt (involving an analysis of steps) to identify the correct sequence of calculations
- convert, and operate on, units of measurement (time, distance, and weight)

Level 7: Problem Solving (Linked with Level 5 in the Test Blueprint)

(a) Skills: Extracts and converts (for example, with respect to measurement units) information from tables, charts, visual and symbolic presentations in order to identify, and then solves multi-step problems.

(b) Example Test Items

- use multiple verbal order of steps with conversion of time units
- translate verbal to arithmetic form, apply units conversion with long division
- convert from mixed number fractions to decimals

Level 8: Abstract Problem Solving (A New Level Generated from the Skills Audit)

(a) Skills: Identifies the nature of an unstated mathematical problem embedded within verbal or graphic information, and then translate this into symbolic, algebraic, or equation form in order to solve the problem.

(b) Example Test Items

- identify the nature of a problem, translate the information given into a mathematical approach, and then identify the correct mathematical strategies to obtain a solution
-

Chapter 3

Pupils' characteristics and their learning environments

Introduction

The aim of this chapter is to present information on some of the characteristics of pupils, their homes and schools. These data have been presented for three reasons. The first is that they present a 'context' for the analyses to be presented later in this report. The second is that, over time, the levels and distributions of the data may change and therefore the data can be used to compare the types of pupils in Standard 6 at different time periods. The third reason is that home background is an important variable in all analyses of educational data. From the home context variables a socio-economic scale has been constructed and it is important for the reader to know exactly which variables that have been included in this scale. It is common sense that schools that have an intake of pupils from 'better' home backgrounds should achieve better than schools that have an intake of pupils from less well-off home backgrounds. Indeed, the research literature abounds with such examples. It is schools that have high scores but have an intake of low socio-economic status (SES) children that are remarkable. Many of the school and teacher variables that appear in subsequent chapters in this report will be examined for their effect on pupil achievement. It will be important to examine not only their pristine relationship with achievement but also their effect once the SES intake of pupils has been taken account of.

Policy suggestion 3.1: The Ministry should conduct a follow up survey of the same target population employed during the first survey (SACMEQ II) in order to study changes of important education indicators over time.

A note on the interpretation of the data analyses

Before presenting the results, it should be stressed that, firstly, the variables presented in this chapter represent a small subset of the larger number of variables for which data were collected. The Ministry will make a separate publication containing descriptive statistics for all variables in the study available to interested readers.

Secondly, it is very important to interpret each statistic in association with its sampling error. It will be recalled from Chapter 2 that the sample was drawn in order to yield standard errors of sampling for pupils in Standard 6 in Tanzania, such that a sample estimate of a population percentage would have a standard error of ± 2.5 percent. For this level of sampling accuracy we can be sure 19 times out of 20 that the population value of a percentage lies within ± 5 percent of the estimate derived from the sample. The sampling errors for means are also given in the tables and the same principle applies for limits of two standard errors of sampling.

Where a percentage or a mean is presented for a sub-group of pupils (such as for zones) then the standard error will be greater than for the sample as a whole. This occurs, in part, because the sample sizes for sub-groups are smaller than the total sample sizes. Had smaller standard errors for sub-groups been required, this would have increased the size of the total sample and also of the budget required to undertake much larger field data collections and data analyses.

To illustrate, consider the first column of entries in Table 3.1. The average age of pupils in months at the time of data collection has been presented separately for each zone and for Tanzania overall. The standard error (SE) of each average has also been presented. For the first zone (Central zone), the average pupil age was 184.3 months at the time of the data collection, and the standard error for this estimate was 2.15 months. That is, there were 19 chances in 20 that the average age of the population of Standard 6 pupils in the Central zone was $184.3 \pm 2(2.15)$ months. In other words it can be said that we can be 95 percent confident that the population value for Central zone was between 180.0 months and 188.6 months.

It is important to note that the value of the standard error for each estimate changed from zone to zone. The variation was caused by two main factors: differences in the distribution of pupils among schools within zones and the structure of the sample design within each zone. The smallest standard error of 0.83 months occurred for the sample estimate of average age for the whole population of Standard 6 pupils in Tanzania. This result was to be expected because the overall sample estimate was based on a much larger sample of schools and pupils than the corresponding estimate for any single zone.

In interpreting the values in Table 3.1 and other tables throughout this report, it is important to remember that the percentages and means have been presented in terms of pupils. That is, pupils were the units of analysis - even though some variables in this report referred to teachers or schools. Where a percentage for a variable that describes teachers has been presented, this percentage should be interpreted as 'the stated percentage of pupils was in schools with teachers having the particular characteristic'. Similarly, a percentage for a variable that describes schools should be interpreted as 'the stated percentage of pupils were in schools with the particular characteristic'.

As a starting point, in order to guide the data analyses, the very broad educational policy question posed in the title to this chapter was divided into several specific questions. These two questions were used to develop a more structured response to the educational policy issues surrounding the main question.

General Policy Concern 1:

What were the personal characteristics (for example, age and gender) and home background characteristics (for example, parent education, regularity of meals, home language, etc.) of Standard 6 pupils that might have implications for monitoring equity, and/or that might impact upon teaching and learning?

Information on the age and sex of Standard 6 pupils, as well as the number of books as well as possessions in their homes, the meals they took and their parents' level; of education have been presented in Table 3.1.

Table 3.1. Means, percentages, and sampling errors for pupil personal and home-related characteristics

Zone	Age (months)		Sex (female)		Books at home (number)		Possessions at home (index)		Meals (index)		Parent education	
	Mean	SE	%	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Central	184.3	2.15	57.8	2.39	26.7	9.59	3.1	0.41	10.4	0.26	2.9	0.18
Eastern	171.4	2.52	52.7	4.64	14.7	3.80	3.5	0.54	10.8	0.26	3.7	0.21
Kagera	189.7	1.88	44.9	3.82	33.4	5.43	2.5	0.24	10.2	0.22	3.1	0.14
Kilimanjaro	171.9	2.05	57.6	3.35	24.0	5.32	2.9	0.23	11.6	0.10	3.3	0.12
Mwanza	185.1	2.29	48.6	3.89	31.1	6.90	3.0	0.38	10.1	0.27	2.8	0.20
Northeast	182.3	2.15	55.1	4.25	35.4	10.73	3.0	0.52	10.6	0.38	3.2	0.17
Northern	179.3	2.83	51.1	1.96	35.6	5.51	4.1	0.64	11.1	0.25	3.2	0.22
Southern Highlands	178.7	2.49	51.1	1.82	36.2	10.75	4.1	0.56	10.5	0.22	3.1	0.22
Southern	187.9	2.72	49.5	2.50	23.8	14.99	2.9	0.49	10.4	0.14	2.8	0.11
Southwest	184.2	2.80	49.2	4.43	38.2	12.99	2.5	0.37	10.2	0.22	3.0	0.15
Western	180.1	2.83	53.1	2.46	41.0	7.89	3.3	0.73	10.0	0.40	3.0	0.24
Tanzania	180.4	0.83	52.2	0.95	31.6	2.83	3.4	0.18	10.6	0.09	3.1	0.06

What was the age distribution of pupils?

The official age of entry to primary school is 7 years (that is when a pupil has turned 7 by 1st January of the year the pupil is admitted for Standard 1) and the primary age cycle is seven to thirteen years. The mean age for all of the Standard 6 pupils during the first week of the twelfth month was 180.4 months. (15 years and 1 month). There were no large variations across the zones except for Eastern and Kilimanjaro zones, which had notably low mean ages of 171.4 and 171.9 months respectively and Kagera zone, which had the highest mean age of 189.7 months. The youngest pupil therefore came from the Eastern zone while the oldest pupil was from Kagera zone.

On the basis of the official age of entry to school if pupils had been admitted to school at 7 years or 84 months of age their mean age would have been 144 months by January 2000 or 155 months (12 years and 11 months) by the date of testing. Thus, pupils in the sample were just over two years (25.4 months) older than might have been expected.

This could largely be explained by the trend in primary education of preferentially admitting to school children who have long since passed the official age of entry to school resulting in a backlog. The other reason could be class repetition especially at Standard 4 where it is generally highest compared to repetition in the other classes. This is so mainly because it is at this point that pupils who fail to score a pass mark in the national Standard 4 examinations have to repeat the class. The repetition rate was 13 percent in 1998, and 9.8 percent in 1999 (Basic Statistics in Education or BSTE, 2003). It was not until the year 2002 that the government took a deliberate decision to reverse the trend by implementing a policy on mandatory enrolment of all age 7 children in formal school and, where space allowed, all age 8, 9 and 10 children as well. However, children of age 11 and beyond are provided with a specially tailored primary education programme for older children, namely, Complementary Basic Education (COBET), thanks to the joint government-UNICEF efforts. Over-age pupils attending primary education under COBET are able to complete primary school in 5 years.

What was the gender distribution of pupils?

The distribution of girls and boys has been presented in the third column of Table 3.1. The national average was 52.2 percent for girls and 47.8 percent for boys, indicating a slight disparity in enrollment where girls' enrollment was slightly higher than that for boys. There were some disparities among the zones. The Central Zone had a particularly high percentage of girls of 57.8 percent. Other zones with high percentages of girls were Kilimanjaro (57.6 percent), North East (55.1 percent). Kagera Zone, on the contrary, had the lowest percentage of girls enrolled in Standard 6 of 44.9 percent. A probable explanation to the unusually high enrollment of girls is the trend of boys in the relevant zones to join the employment sector in preference to schooling. Conversely, low enrollment of girls in Kagera could probably be due to the heavy burden that young girls shoulder as heads of the households after the death of their parents. In the current circumstances, the largest proportion of these deaths could be linked to the high incidence of HIV/AIDS. Such a heavy responsibility can impair the school attendance of affected children (The Economic Survey 2002). The Ministry, in collaboration with ministries concerned with Community Development, Gender and Children, and Labour and Social work could investigate the disparities and identify options that would eliminate the gender gap in Kagera and other regions that have been hit hardest by HIV/AIDS. Community-based mechanisms could be put in place in Kagera to provide, for instance, care

to orphaned children and thereby relieve girls and boys of the household responsibilities they shoulder. This would then enable them to attend classes regularly during school days.

Policy suggestion 3.2: The Ministry in collaboration with the Ministry of Community Development, Gender and Children (MCDGC), and the Ministry of Social Work, Labour and Sports (MSWLS) should investigate the gender disparities in school enrolment and identify options that would eliminate the gender gap. In addition, community-based mechanisms should be put in place in the worst-affected zones such as Kagera to provide, for instance, care to orphaned children that would relieve girls and boys of the inordinately heavy household responsibilities and thereby ensure that they attend classes regularly during school days.

What were the home circumstances of Standard 6 pupils?

The home can be considered to be made up of various components. One component concerns the wealth of the home in monetary terms. In Southern and Eastern Africa, most children do not know how much their parents earn. Thus proxy or indirect methods of assessing the wealth of a home must be used. One aspect is the goods they possess at home (home possessions). A second component is the intellectual milieu as characterised by the education of the parents and the books they have at home. Both of these can be of use to the child's learning.

How many books were there in pupils' homes?

Evidence from research shows that it is important for pupils to be able to read at home if they are to perform well in reading tests (Elley, 1992). The home therefore is regarded as an important reading source for pupils. Standard 6 pupils were asked to indicate the number of books they had in their homes. They were given six categories of responses from which to choose, namely: '1' = zero books in the home; '2' = 1-10 books in the home; '3' = 11-50 books in the home; '4' = 51-100 books in the home; '5' = 101-200 books in the home; and '6' = 200 books or more in the home. The ranges were recoded and midpoints were used to estimate the total number of books in the home. The value 1 was recoded as zero books, 2 was recoded as five books and so on.

It can be seen from Table 3.1 column 3 that the average Standard 6 pupil in Tanzania came from a home where there were around 32 books. There were significant variations among the zones, ranging from a mean of 41 books in Western zone to around 15 books in Eastern zone. Given the large standard errors in some zones especially the Southern, South-west, Central zones, it would appear that the number of books in the homes was small and the school and other resources like public libraries would be needed to offset the paucity of reading materials in the homes as an alternative reading resource for many pupils. About 80 percent of Tanzania's population lives in rural areas and there are few libraries in these rural areas. Libraries are mainly located at regional towns, and the majority of the pupils find it difficult to access them. It can be seen that the pupils in the Eastern zone were most disadvantaged in terms of reading materials at home. Given the urban nature of this zone (which includes Dar es Salaam city); it is surprising that there were so few books in pupils' homes. If there are few books in the home, then the Ministry may wish to offset the effects of this deficit by ensuring that children can take books home from school to read. Alternatively, the Ministry can provide mobile libraries that visit villages at least once every two weeks.

What was the socio-economic status of pupils' parents in terms of possessions, housing conditions (lighting, floor, wall, roof), and livestock?

Pupils were asked to indicate the number of possessions that were in their homes from a list of 13 possessions. These were a daily newspaper, a weekly or a monthly magazine, a radio, a TV set, a video cassette recorder (VCR), a cassette player, a telephone, a car, a motorcycle, a bicycle, piped water, electricity (mains, generator, solar), and a table to write on. Pupils were given a score of 0 for the item they indicated that they did not have, and a score of 1 for an item they had. The number of possessions owned in the home was summed for each pupil. The lowest score possible was zero for a pupil who did not have any of the items and the highest was 13.0 if a pupil had all the items. The results have been presented in column 5 of Table 3.1.

In Tanzania the average Standard 6 pupil came from a home whose average number of possessions was 3.4 items. There were variations among the zones ranging from a relatively

high mean of 4.1 for Northern and Southern Highlands zones to a low mean of 2.5 for South West and Kagera zones. Compared to the highest possible score of 13 if a pupil had all items, the average for Tanzania was quite low.

Pupils from Northern and Southern Highlands zones came from relatively well off homes (with a mean of 4.1) whereas those from South West and Kagera zones came from the poorest homes (with a mean of 2.5). The results are disturbing for Kagera zone, which historically has been among the areas with relatively more educated and well off inhabitants. A probable explanation to the entrenched poverty could be the heavy dependence of the natives on the coffee and banana crops which, unfortunately, have been performing poorly on the market for a long period. The high incidence of HIV/AIDS in the zone could be another possible reason for the high level of poverty. It is also known that HIV/AIDS feeds on poverty, and therefore poverty drives the HIV/AIDS epidemic. Pupils from Kagera were particularly disadvantaged and ministries concerned with the provision of social services need to establish grass root mechanisms that would facilitate children's access to and participation in education. Overall, Standard 6 pupils in Tanzania came from families of low socio-economic status.

Policy Suggestion 3.3: The Ministry should liaise with the President's Office, Regional Administration and Local Government (PORALG) and Ministry of Community Development Gender and Children (MCDGC) to urgently devise mechanisms at community level to share the burden of the house hold headships by orphaned children in order to create space for the orphans to attend schools.

How regularly did pupils eat meals?

It is known from research that lack of concentration and perseverance in school can be attributed, *inter alia*, to the poor nutritional status of the learners (Pollit, 1990). Provision of regular meals to pupils was considered to be among the determinants that were likely to influence learning achievement. A further question concerned the nutrition of the pupils at least in terms of having three meals a day, even if the nutritional value of each meal was not known. The question asked about a morning meal, a midday meal and an evening meal and how many times a week they ate each of the meals. Pupils' responses were measured against a 12-point scale, which was used to assess the number of meals that pupils ate in a week. If

they did not eat any of the meals each day per week they were given a score of 1, a score of 2 if they ate between 1 and 2 meals each day per week, a score of 3 if they ate between 2 and 3 meals each day per week and a score of 4 if they ate all the meals each day per week. A score of 3, for instance meant that they did not eat at all while a score of 12 indicated that they ate every meal each day. The results have been presented in the fifth column of Table 3.1.

In Tanzania the mean index was 10.6. That is to say the average Standard 6 pupil ate between 2 and 3 meals a day. There were no major disparities among the zones in the regularity with which pupils ate meals. A general observation made, however, is that pupils in the northern part of the country, that is, Kilimanjaro and Northern Zones, had more meals (mean indexes of 11.6 and 11.1 respectively) than those in the western and southern part of the country (Western, Southwest, and Southern zones) where mean indexes of 10.0, 10.2 and 10.4 respectively were recorded. It is surprising that Western and Southern zones had the lowest meal indexes when, agriculturally, these areas are among the most productive.

Further analysis indicated that nationally the majority of the pupils tended not to eat the morning meal every day per week as they did for midday meal, and evening meal. About 55 percent of the pupils indicated that they ate the morning meal every day per week; whereas about 83 percent indicated that they ate the afternoon meal (lunch) every day per week and 94.1 percent indicated that they ate dinner every day per week. In addition pupils from Mtwara region in the Southern zone appeared to be most disadvantaged in the nutritional aspect, with only 37.0 percent of them indicating that they ate every meal each day per week. Other regions with relatively low percentages of pupils who indicated that they ate three meals every day per week were Tabora in Western zone (58%) and Pwani in Dar es Salaam zone (60%). These figures were particularly disturbing. In addition, the fact that nationally only about half of them ate the morning meal, clearly there appeared to be a very big possibility that substantial proportions of Standard 6 pupils attended classes when they were hungry. In addition the low figures for the Southern and Western zones could most probably be partly explained by the relatively low level of development of communities which could result in attaching low importance to providing children with three meals a day. Sustainable school feeding programs which use local produce need to be initiated particularly in the severely affected zones to alleviate this problem.

Policy suggestion 3.4. The Ministry in collaboration with PORALG should explore the possibility of formulating a national strategy for sustainable school feeding programs which use locally produced foods with priority to the severely affected zones.

What was the level of the parents' education?

Pupils were asked separate questions about the educational level of their mothers and fathers and the results for each pupil's mother and father were summed up to provide 'an index of parent education'. The information about the educational level of both parents was coded as follows: '1' = neither parent had received any schooling. '2' = 'both parents had received some primary education; '3' = both parents had received all primary education; '4' = both parents had received some secondary education, '5' = both parents had received all secondary education, '6' = both parents had received some post secondary education including university education.

The average index for parents' education in Tanzania was 3.1. This means, on average, Standard 6 pupils had both parents who had completed all of primary education. There were small variations among zones, except for Eastern Zone where parents' education tended to be high (with the mean score of 3.7, implying that parents had completed some secondary level education). On the other hand, Mwanza and Southern Zones had parents with a relatively low level of education, with a mean index of 2.8 implying that those parents had only completed some primary education. The high mean index for Eastern Zone (where the largest city Dar es Salaam is located) could be largely explained by the predominantly urban nature of the zone which, due to its unparalleled employment opportunities and attractive business environment, attracts the most educated part of the population. Pupils in the Eastern zone, therefore, were most advantaged in this regard.

Policy suggestion 3.5. The Adult education unit of the ministry should provide parents in Mwanza and Southern Zones with at least primary level of education through strengthening its adult education programs in these zones.

A cross-tabulation between the levels of fathers' and mothers' education has been presented in Table 3.2.

Table 3.2. Cross-tabulation of percentages of father's and mother's education

		Mothers' Education							All Mothers
	Level of education	No School	Some Primary	All Primary	Some Secondary	All Secondary	Some Post-Sec	Completed University	
Fathers' Education	No School	58	14	17	3	1	0	0	100
	Some Primary	19	19	52	1	2	1	0	100
	All Primary	9	9	71	2	3	1	1	100
	Some Secondary	5	2	51	8	13	7	6	100
	All Secondary	3	4	44	1	34	3	7	100
	Some Post-Sec	5	6	37	3	10	21	12	100
	Completed University	1	3	20	3	21	9	39	100
	All Fathers	14	9	51	2	9	3	5	100

The Table depicts the percentages of mothers with certain levels of education and the percentage of fathers with different levels. Taking the first row in the table, it can be seen that there were 58.0 percent of fathers with no schooling, and these were married to wives with no schooling; 14.0 percent were married to wives with some primary; and 17.0 percent were married to wives who had completed primary school.

Further analysis indicates that the modal education of fathers and mothers was primary education (51.0% fathers). Standard 6 pupils had parents whose education was predominantly primary education, however smaller percentages of their mothers tended to have primary education level.

How many days were pupils absent in the previous month, and what were the reasons for these absences?

Absenteeism can hamper learning because the child will fail to follow the learning tasks that are regularly developed with days of schooling. Pupils were asked to indicate how many days they had been absent during the month before the study was carried out. The results have been presented in Table 3.3.

Table 3.3 Percentages, means, and sampling errors for the pupil language, days absent, and repetition

Zone	Speak English		Days absent		Repetition	
	%	SE	Mean	SE	%	SE
Central	93.5	1.55	2.5	0.36	14.5	3.72
Eastern	97.5	1.03	2.7	1.07	12.9	6.51
Kagera	85.2	3.56	2.9	0.64	33.9	6.62
Kilimanjaro	95.3	1.04	1.4	0.35	20.2	5.47
Mwanza	85.8	4.08	3.2	0.61	36.8	8.78
Northeast	94.0	3.50	2.6	0.61	5.5	1.62
Northern	86.8	2.78	2.3	0.47	22.7	6.04
Southern Highlands	92.4	3.85	0.9	0.20	28.2	4.57
Southern	86.4	7.69	2.7	0.73	20.5	5.49
Southwest	87.9	4.50	2.3	0.50	36.7	9.79
Western	81.6	5.04	1.6	0.38	31.6	5.49
Tanzania	89.9	1.19	2.1	0.17	23.3	1.81

The national mean for pupil absenteeism in Tanzania was 2.1 days. Mwanza Zone had the highest mean of 3.2 days while Southern Highlands had the lowest mean of 0.9 days. Given that in Tanzania pupils attend school for 22 days in a month and 194 days in a year, the average Standard 6 pupil was absent for 18.52 days in a year (9.55% of all school days). These results did not reflect a serious problem in the system.

Pupils were further requested to state the reasons why they were absent. These reasons fell into three categories, namely, illness, family reasons (such as the need look after parents or siblings), fees and work. The results have been presented in Table 3.4.

Table 3.4 Percentages and sampling errors for reasons of pupils' absenteeism

Zone	Illness		Family reasons		Fees		Work	
	%	SE	%	SE	%	SE	%	SE
Central	42.0	5.58	7.6	2.08	0.0	0.00	5.8	2.05
Eastern	34.1	6.85	6.5	2.16	4.1	2.20	1.6	0.79
Kagera	45.9	5.12	16.3	4.46	4.1	1.54	5.5	2.31
Kilimanjaro	27.9	4.69	9.5	3.23	2.3	1.61	2.2	1.06
Mwanza	39.6	5.19	12.6	2.03	2.7	1.06	9.1	2.76
Northeast	41.0	5.41	9.6	3.10	1.2	0.83	5.1	1.59
Northern	37.5	5.59	8.4	2.02	1.6	1.08	7.3	2.53
Southern Highlands	15.3	1.72	5.1	1.70	0.0	0.00	2.6	1.05
Southern	37.6	6.65	9.8	3.68	2.4	1.92	5.0	2.24
Southwest	31.2	6.44	12.3	3.94	2.2	0.87	6.0	1.99
Western	27.5	5.82	13.9	4.06	1.6	0.74	6.3	2.20
Tanzania	32.7	1.67	9.3	0.83	1.7	0.35	5.1	0.62

About 33 percent of Standard 6 pupils were absent due to illness. There were 9.3 percent of them who were not in school due to family reasons while 1.7 percent and 5.2 percent of them were absent due to school fees and work respectively. There were considerable variations across the zones with regard to illness as a reason for absenteeism, with 45.9 percent of pupils in Kagera zone being particularly vulnerable. In the Southern Highlands Zone a relatively small percentage of pupils (15.3%) was affected by illness. However, these results for Kagera were not unexpected since it is this zone that has the highest HIV/AIDS infection rates, and it follows that the number of children affected by illness is likely to be much higher than that in other zones.

Family reasons ranked second among the reasons for pupil absenteeism. There were large variations among the zones, with the smallest percentage (5.1%) of children not attending school for family reasons recorded in Southern Highlands and the highest of 16.3 percent recorded in Kagera. Again, it is likely that in Kagera Zone more children would be taking care of their brothers and sisters due to the higher prevalence of orphanhood in the zone

resulting from the high incidence of HIV/AIDS-related deaths. It is, however, interesting to observe that Southern Highlands pupils were the least affected by family reason yet the situation of orphanhood and the incidence of HIV/AIDS-related deaths are comparable with that of Kagera.

The third most common reason for pupils' absenteeism from school was 'work', but wide variations were noted across the zones. Pupils in the Eastern Zone who were absent because of work were 1.6 percent whereas in Mwanza Zone the percentage was 9.1 percent. This result was not unexpected since in Eastern Zone, which includes Dar es Salaam City, there are many organizations fighting against child labour. Furthermore, the population in this zone is generally affluent and more educated, and therefore not only is there likely to be less need for child labour, but also a greater likelihood that the population is aware of the ill effects of child labour and the value of education. On the other hand Mwanza largely has an urban population, but the fact that there are many economic activities such as fishing and gold mining could attract youths to school. However, this is not the case.

School fees ranked lowest among the four reasons that caused pupils' absenteeism. There were considerable variations among zones, with the largest population of pupils affected by school fees found in Eastern and Kagera zones (4.1%). No pupil was affected by school fees in the Southern Highlands and Central Zones. The issue of school fees will completely cease to be a factor impacting on pupil attendance because the Government of Tanzania scrapped school fees with effect from the year 2002.

Clearly, illness affected pupils' attendance most. It is known from many of the findings of school map surveys in Tanzania that many pupils in primary schools fell sick most frequently of malaria, diarrhoea, cough, and bilharzias, (Morogoro Urban and Kibaha School Map reports) all of which are mainly environment borne diseases, which could be minimized if sanitation was improved in school as well as in the homes. Normally, pupils acquire illness from the home environment or in the school environment, or in a combination of the two. However the opportunistic infections caused by HIV/AIDS might also contribute to the high incidence of illness. Cases of HIV/AIDS-related illness are more complicated, and therefore require more comprehensive interventions by the Ministry of Education and Culture in

collaboration with other actors. Such interventions might also include the mobilisation of local communities within PORALG framework.

Policy suggestion 3.6. The Ministry in collaboration with the Ministry of Health (MOH) and local communities should improve school hygiene under the auspices of the School Health Education Program. Mechanisms used for making schools child friendly within the Child Friendly Schools initiative (CFS) should be explored.

Family reasons were also cited in local researches as being directly linked to pupil participation in school. In particular, families prefer to send their children to work and improve the family's economic well being than to send their children to school because many children who complete their primary education do not get gainful employment as expected, parents have lost faith in schooling. The school system should revisit its learning objectives so that school is more responsive to the changing needs of society individuals. Families seem to require their children to support them in raising their daily incomes. With a per capita GDP of USD 265 that is about Tshs 270,000 and about 50% of the population being below the poverty datum line, it would not be a surprise that some parents are tempted to require their children to contribute to family income. However, the practice assigning domestic work before they are ready for it should be monitored so that it does not interfere with children's well being and their participation in school. It is also important to point out that some institutions and individuals engage children for work because child labour is cheap. The challenge in combating this practice is enormous and tricky because the employer and parents act in collusion, and try to evade the law on account of the mutual benefit they derive from this practice.

Policy suggestion 3.7. The Ministry should liaise with PORALG to enforce the law on compulsory attendance at community level.

Policy suggestion 3.8. The Ministry in collaboration with the Tanzania Institute of Education should review the curriculum so that it becomes more relevant to the needs of society.

How many pupils had repeated a grade?

The Ministry policy on repetition is that, under normal circumstances, a pupil can repeat a class if he or she has been unable to attend lessons for a long period due to illness or other

genuine causes and it is felt by teachers and parents or by other authorities that the pupil will not to be able to follow instructions in his next year of study, or if he is seriously underachieving. Pupils are allowed to repeat only twice in their primary school cycle. The highest repetition rates tend to occur at Standard 4 level where pupils sit for the national Standard 4 examination and those that do not reach pass mark have to repeat the class. In this study pupils were asked to indicate if they had repeated class at least once, and the analyses of their responses have been presented in Table 3.3.

On average, 23.3 percent of Standard 6 pupils in Tanzania repeated a class at least once. The highest repetition rate was in Mwanza (36.8%) followed by Southwest Zone (36.7%) and Kagera (33.9%). Central and Eastern Zones had the lowest percentages of repetition of 5.5 and 12.9 percent respectively.

Repetition was an endemic problem in all zones, but its scale varied across the zones. The figures for Kagera, Mwanza, Southwest, and Western Zones should be of concern to the Ministry since their scale is so high that this adversely affects the system's internal efficiency and consequently on resource utilisation. An investigation into why repetition was so high in the four zones should be conducted.

Policy suggestion 3.9. The Inspectorate department should carry out an investigation into why repetition was high particularly in Kagera, Mwanza, Southwest, and Western Zones.

Where did pupils live during the school week?

Ideally, the environment in which the child lives should facilitate the child's learning. The child needs material as well as other forms of support and encouragement from those he or she lives with. It is normal that parents, guardians, or institutions are regarded as the principal duty bearers in this regard. Pupils were asked to indicate where they stayed during the school week. The possible responses were: 'with parent'; 'with relatives', 'in a hostel' and 'by myself'.

Table 3.5. Place where pupils stay during the school week

Zone	Place where pupils stay during the school week							
	Parent/Guardian		Relatives/Family		Hostel/Board		Self/Children	
	%	SE	%	SE	%	SE	%	SE
Central	85.0	3.57	1.7	1.02	10.7	3.22	2.5	1.03
Eastern	88.3	2.94	4.1	2.34	4.9	2.68	2.7	1.40
Kagera	87.9	1.73	4.1	1.44	5.6	1.39	2.4	1.29
Kilimanjaro	87.7	3.48	5.7	1.89	3.2	1.32	3.3	1.16
Mwanza	91.5	3.23	3.5	1.14	2.5	1.30	2.5	1.54
Northeast	91.3	2.25	2.1	0.94	3.8	1.51	2.9	2.18
Northern	90.4	2.23	4.0	1.09	3.7	1.09	2.0	1.02
Southern Highlands	89.9	2.09	2.4	0.89	4.2	1.57	3.5	1.52
Southern	93.0	1.55	3.0	1.19	3.4	1.39	0.7	0.67
Southwest	85.1	5.35	1.7	0.73	10.7	3.99	2.5	1.50
Western	84.3	3.98	2.2	0.91	9.2	3.05	4.3	1.22
Tanzania	88.8	0.91	3.1	0.40	5.4	0.65	2.8	0.44

In Table 3.5 it can be seen that most of Standard 6 pupils stayed with a parent or guardian (88.8%). About 5 percent of Standard 6 pupils stayed in a hostel or boarding house and 3.1 percent stayed with relatives or family while about 3 percent of them stayed alone. There were no great variations among the zones in all the four categories. However in the category of hostel/board in the Central and Southwest Zones the percentages were relatively high, these being 10.7 percent each compared to the national average of 5.4 percent. This result is not unexpected since over the years the government has a programme of building hostels as an incentive for pastoralists, fruit gatherers and other less developed communities to send and retain their children in school. It would appear therefore that, overall, Standard 6 pupils were well catered for in this respect.

What was the socio-economic status of pupils' parents in terms of possessions, housing conditions (lighting, floor, wall, roof), and livestock?

Lighting in pupils homes

Lighting in the home is among the factors that enhance the pupil's opportunity for extended learning after school. The type of lighting in pupils' homes can reflect the socio-economic status of the pupils' homes, particularly where a range of lighting sources like the most expensive electrical lighting to the cheapest and crudest one like kerosene burner is available. Tanzania is mainly rural, with about 80 percent of its population living in the rural setting. Unlike the urban areas, in rural areas there is less accessibility to social amenities like electricity and piped water. It is expected that pupils in the rural homes would have much less access to electricity than those in the urban areas. It was important to establish the types of lighting in the home environment of the pupils as an important attribute to the personal characteristics of the pupil.

In Table 3.4 (a) the percentages of different categories of lighting in pupils' homes for different zones and for the country as a whole have been given.

Table 3.4(a). Percentages and sampling errors for the lighting in pupils' homes

Zone	No light		Candle/Oil Lamp		Gas lamp		Electric lighting	
	%	SE	%	SE	%	SE	%	SE
Central	7.7	3.30	80.5	5.59	1.3	0.72	10.6	4.93
Eastern	3.7	1.83	39.8	8.61	0.6	0.56	55.9	9.28
Kagera	17.0	4.81	76.3	5.29	0.9	0.61	5.8	3.02
Kilimanjaro	0.9	0.66	78.1	3.62	0.4	0.35	20.6	3.61
Mwanza	7.2	3.72	82.3	6.72	0.5	0.48	10.1	5.82
Northeast	0.2	0.18	72.2	7.69	0.8	0.57	26.8	7.85
Northern	2.9	0.98	70.7	9.51	2.6	1.23	23.8	10.05
Southern Highlands	14.8	5.14	59.4	7.25	2.4	0.91	23.3	7.44
Southern	3.6	2.38	94.2	3.43	0.8	0.58	1.4	0.97
Southwest	14.6	4.09	81.0	4.57	2.2	1.19	2.2	1.09
Western	22.7	5.34	57.4	7.84	1.6	0.74	18.3	10.40
Tanzania	8.6	1.15	69.4	2.51	1.4	0.28	20.6	2.53

In Tanzania, overall, 69.4 percent of Standard 6 pupils came from homes which used candle/oil lamp for lighting. As expected, much lower percentages of pupils came from homes which used electric lighting and gas lamp (20.6% and 1.4% respectively); while 8.6 percent of them came from homes that had no light.

Among the zones there were some variations in each of the 4 categories of lighting. Western zone had a particularly high percentage of pupils from homes with no light (22.7%) while Northeast and Kilimanjaro had the lowest percentages of pupils from homes with no light (0.2% and 0.9% respectively).

Southern zone had a particularly high percentage of homes that used oil lamp/candle (94.2%). Other zones with relatively high percentages were Mwanza which had 82.3 percent, Southwest which had 81 percent, and Central which had 80.5 percent. By contrast, Eastern zone had the lowest percentage (39.8%) of homes that used oil lamp/candle.

Eastern zone had the highest percentage of pupils who stated that they came from homes which used electric lighting (55.9%). On the other hand, Southern zone had the lowest percentage of 1.4 percent, followed by Southwest zone which had 2.2 percent.

The high percentages of families using electricity in Eastern zone could most probably be explained by the fact that the zone is fairly large urban population and has a relatively large concentration of industries, and is therefore widely supplied with electricity which inhabitants can easily access. The other reason is that its inhabitants, especially those living in Dar es Salaam, is either employed by institutions or is self employed and hence presumably more assured of regular income to afford electrical lighting. On the other hand the results of some homes having no light, particularly in the western zone, were rather disturbing and made pupils from the zone particularly disadvantaged

Overall, the results appear to suggest that the average Standard 6 pupil in Tanzania came from a home which used candle/oil lamp, or gas lamp for lighting. Far fewer Standard 6 pupils, comprising about one fifth, came from homes that used electricity for lighting.

Structure of pupils' homes

Structure of pupils' homes is yet another variable that was used to measure the wealth of the home. It is expected that a child would attend to his homework and other school work better if he or she has good shelter. For instance, it is clear that a child who stays in a home that is well lit in the night has an environment which motivates him or her to do homework. The child also needs to be protected against other adversaries for his/her security, and a good home contributes in this regard. Therefore the quality of the home was considered to be an important home characteristic.

Pupils were asked to indicate the structure of their homes and three variables namely, the floors, walls, and roofs were identified. The responses for floors included whether floors were either not sealed were made of wood cement or carpet/tiles. The responses for walls included whether they were not sealed, or were made of stone, sheets/wood, or cut stone/bricks. The responses for roofs included whether they were not sealed, or were made of metal/asbestos, cement/concrete or tiles. The three sets of variables were used to produce

an index that provided a picture of the general quality of pupils' homes. The results of the responses have been presented in Tables 3.4 (b) up to 3.4(e).

Table 3.4(b). Percentages and sampling errors for structure of floors in pupils' homes

Zone	Not sealed		Wood		Cement		Carpet/Tiles	
	%	SE	%	SE	%	SE	%	SE
Central	55.6	6.87	1.7	1.68	41.0	6.88	1.7	0.76
Eastern	19.3	6.81	0.4	0.45	77.2	6.97	3.1	1.42
Kagera	49.7	5.74	3.7	1.83	43.4	4.72	3.2	1.33
Kilimanjaro	24.4	4.81	1.6	0.87	72.4	4.61	1.5	0.84
Mwanza	54.0	11.03	0.7	0.73	41.8	10.72	3.4	1.40
Northeast	39.2	6.50	0.7	0.44	55.6	7.17	4.5	2.05
Northern	44.4	7.77	0.7	0.54	52.4	7.99	2.4	1.05
Southern Highlands	44.4	10.57	1.2	0.68	50.8	11.41	3.5	1.52
Southern	68.2	4.77	5.4	3.62	24.8	4.84	1.6	1.09
Southwest	46.3	8.34	2.6	1.35	47.7	7.79	3.4	1.36
Western	38.1	8.09	3.0	1.08	53.9	8.23	5.0	1.83
Tanzania	43.2	2.66	1.7	0.36	52.0	2.75	3.1	0.45

In Table 3.4 (b) it can be seen that about 50 percent of Standard 6 pupils in Tanzania came from homes with cement floors whereas 43.2 percent of them came from homes whose floors were not sealed, that is, the floors were of either earth/clay or canvas. Only 4.8 percent of pupils came from homes whose floors were wooden or made of carpets/tiles.

Taking the two predominant variables for structure of floors in pupils' homes that is the 'not sealed' and 'cement', it can be seen that there were large variations among the zones. Eastern Zone had the highest percentage (77.2 %) of homes with cement floors followed by Kilimanjaro which had 74.2 percent. Southern Zone had a particularly low percentage of homes with cement floors (24.8%). Other zones with relatively low percentages were Central and Mwanza which had 41.0 percent and 41.8 percent respectively.

In the 'not sealed' floor variable there were similarly considerable variations among the zones, with the Southern zone being particularly high (68.2%) followed by Central zone (55.6

%). Eastern Zone had the lowest percentage (19.3 %) followed by Kilimanjaro which had 24.4 percent.

In Table 3.4(c) results of pupils' responses on structure of walls in their homes have been presented.

Table 3.4(c). Percentages and sampling errors for structure of walls in pupils' homes

Zone	Not sealed		Stones		Sheets/Wood		Cut stone/Bricks	
	%	SE	%	SE	%	SE	%	SE
Central	13.1	3.97	43.7	6.83	12.1	2.75	31.1	6.69
Eastern	13.3	6.14	39.4	6.83	13.0	2.89	34.3	7.45
Kagera	23.8	4.33	30.4	2.68	13.2	3.16	32.6	4.01
Kilimanjaro	5.0	1.88	29.2	7.18	16.5	3.59	49.4	6.59
Mwanza	15.8	4.29	48.6	6.10	11.7	3.05	23.9	4.76
Northeast	15.4	3.95	23.4	4.05	16.5	3.88	44.7	6.63
Northern	15.3	3.86	27.9	4.91	10.5	2.78	46.3	5.99
Southern Highlands	5.4	2.44	43.1	5.73	6.3	1.64	45.1	6.68
Southern	23.9	8.61	20.7	6.79	13.2	4.99	42.1	17.10
Southwest	17.9	3.42	28.5	5.48	7.6	1.64	45.9	6.52
Western	15.6	4.15	39.0	5.17	13.4	2.91	32.0	6.14
Tanzania	13.8	1.37	35.0	1.88	11.7	0.93	39.5	2.30

In Tanzania 39.5 percent of Standard 6 pupils came from homes whose walls were made of cut stone/bricks and 35.0 percent were from homes whose walls were made of stone. Of the remaining, 11.7 percent were from homes whose walls were made of sheets/wood and 13.8 percent came from homes whose walls were not sealed.

There were large variations among the zones. Kilimanjaro had the largest percentage of pupils who came from homes whose walls were of cut stone/bricks (49.4%). On the other hand it had, as would be expected, the lowest percentage of pupils from homes whose walls were not sealed (5.0%). Mwanza Zone had the lowest percentage of pupils with homes with cut stone/bricks (23.9%) but it had the highest percentage of pupils who were from homes whose walls were made of stones (48.6%). Southern Zone had the lowest percentage of homes with stone walls but it had the highest percentage of homes with walls that were not sealed (23.9%).

It can be inferred from these results that about three-quarters of pupils (35.0+39.5+11.7) came from homes with walls made of strong materials, namely, stones cut stone/bricks.

In Table 3.4 (d) the results of pupils' responses on the structure of roofs of pupils' homes have been presented.

Table 3.4(d). Percentages and sampling errors for structure of roofs in pupils' homes

Zone	Not sealed		Metal/Asbestos		Cement concrete		Tiles	
	%	SE	%	SE	%	SE	%	SE
Central	39.3	7.15	55.3	6.70	4.5	1.72	0.8	0.54
Eastern	14.3	7.63	71.6	7.14	7.1	2.12	7.0	2.57
Kagera	26.5	5.36	58.9	5.12	13.6	4.16	1.1	0.57
Kilimanjaro	4.5	2.63	89.2	3.32	4.1	1.62	2.2	1.08
Mwanza	41.9	11.24	49.3	9.94	8.4	2.46	0.4	0.45
Northeast	27.5	5.63	63.4	5.37	5.3	1.84	3.9	1.95
Northern	27.8	5.52	64.8	4.84	3.6	0.74	3.8	1.64
Southern Highlands	23.2	4.61	72.4	4.14	3.0	0.96	1.4	0.85
Southern	47.5	6.12	47.8	6.05	1.3	1.34	3.4	2.69
Southwest	33.2	8.47	56.9	7.85	7.9	2.27	2.0	1.09
Western	33.4	6.68	54.4	6.57	9.4	2.60	2.8	1.37
Tanzania	28.5	2.10	63.2	1.95	5.6	0.54	2.8	0.47

In Tanzania 63.2 percent of Standard 6 pupils came from homes with metal/asbestos roofing while 28.5 percent of them were from homes with roofs that were not sealed (that is they were of cardboard/plastic/canvas, grass or mud thatched). Other types of roofs were cement or concrete (5.6%) and tiles (2.8%).

Kagera Zone had a particularly high percentage of homes with cement or concrete roofs (13.6%) while Southern Zone had the lowest percentage of such homes (1.3%).

Eastern Zone had the highest percentage of homes with tile roofs (7.0%) while Mwanza had the lowest percentage of 0.4 percent. Both cement and tiles roof technologies are less

common because of their high cost and this renders them unaffordable to many ordinary Tanzanians.

Overall, about 70 percent of Standard 6 pupils came from homes which were of good quality roofing, that is, roofs made of metal/asbestos, concrete or tiles.

These results for the four variables reflected disparities in each of the variables which could probably be explained largely by the relatively high level of development in Kilimanjaro and Eastern Zone (mainly Dar es Salaam). The reverse is equally true in the case of Southern, Central and Mwanza Zones which are less developed. The other probable explanation could be the culture of building mud houses that is prevalent in Central Zone where floors (and even roofs) are made of thatch blended with mud. In Mwanza, the prevailing culture is that of homes made of grass thatch.

In Table 3.4 (e) an index for the general quality of pupils' homes was constructed through recoding the four variables, that is, lighting, structure of floor, structure of wall and structure of roof {analyzed in Tables 3.4 (a) to 3.4 (d)} and linking them to constructs of quality of homes. Each of the four variables was measured on a 4-point scale so as to give a maximum score of 16 for a respondent who scored 4 for each of the four variables.

Table 3.4(e). Means and sampling errors for the general quality of pupils' homes

Zone	General quality of pupil's homes (Index)	
	Mean	SE
Central	8.3	0.42
Eastern	10.5	0.55
Kagera	8.4	0.32
Kilimanjaro	10.1	0.24
Mwanza	8.2	0.55
Northeast	9.6	0.46
Northern	9.3	0.53
Southern Highlands	9.2	0.51
Southern	7.9	0.43
Southwest	8.6	0.37

Western	8.8	0.57
Tanzania	9.1	0.16

In Tanzania the mean index of the quality pupils' homes was 9.1, and the variations among the zones was small. Eastern Zone had the highest mean of 10.5 followed by Kilimanjaro which had a mean of 10.1. By contrast, Southern Zone had the lowest mean index of 7.9. Other zones with relatively low means were Mwanza which had a mean of 8.2, Central with a mean 8.3, and Kagera with a mean of 8.4.

The results reflect a pattern that is broadly similar to the one presented in Tables 3.4(b) through 3.4(d), and indicates that, on average, Standard 6 pupils came from homes with homes of a modest quality.

Amount of livestock in pupils homes

The amount of livestock in pupils' homes can reflect the wealth and, by extension, the socio-economic of the families. Pupils were asked to indicate the amount of livestock they had in their homes for each of the following: cattle, sheep, goats, horses/donkeys, pigs and chicken. Their responses have been presented in Table 3.5.

Table 3.5. Means and sampling errors for the amount of livestock at pupils' homes

Zone	Cattle		Sheep		Goats		Horses/ Donkeys		Pigs		Chickens	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Central	10.8	2.02	5.2	1.64	8.2	1.93	0.7	0.15	0.1	0.06	11.7	1.90
Eastern	1.5	0.44	4.7	4.46	1.0	0.31	0.1	0.07	0.5	0.30	26.3	11.78
Kagera	2.7	0.47	0.5	0.11	3.6	0.68	0.2	0.07	0.4	0.08	6.2	0.81
Kilimanjaro	5.8	1.75	3.0	0.65	5.5	1.24	0.2	0.08	0.8	0.17	9.4	1.07
Mwanza	8.7	2.13	6.5	4.49	4.7	1.01	0.4	0.18	0.1	0.08	10.9	1.47
Northeast	1.9	0.54	1.2	0.75	3.2	1.02	0.1	0.04	0.2	0.08	14.7	2.41
Northern	7.4	1.49	4.3	0.94	5.0	0.76	0.8	0.20	0.3	0.10	9.6	1.32
Southern Highlands	2.9	0.40	0.8	0.15	3.6	1.35	0.2	0.08	0.9	0.13	8.5	1.98
Southern	0.6	0.14	1.2	0.65	3.4	0.83	0.0	0.00	0.4	0.12	7.5	1.11
Southwest	3.6	0.87	1.0	0.47	6.2	2.44	0.7	0.62	0.7	0.28	10.3	4.02
Western	13.7	4.07	5.2	1.25	8.5	1.84	1.5	0.51	1.9	0.74	11.4	2.01

Tanzania	5.7	0.57	3.2	0.63	4.8	0.40	0.5	0.07	0.6	0.09	11.7	1.27
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The national means for the listed livestock were 5.7 for cattle, 3.2 for sheep, 4.8 for goats, 0.5 for donkeys/horses, 0.6 for pigs and 11.7 for chickens. The means suggest that Standard 6 pupils in Tanzania came from families which had around 6 cattle, 3 sheep, 5 goats 1 donkey 1 pig and about 12 chickens.

There were large variations among the zones in all categories of livestock, ranging from no livestock especially with regard to the less popular livestock like horses/donkeys and pigs to very high means when it comes to the more popular livestock like chicken where in Eastern Zone the mean was 26.3. This result was expected since raising chicken in Dar as Salaam zone is popular among many families as it is considered to be a venture that is easy to manage. However, considering the rather low value of chicken, their contribution to the family wealth would be minimal, a result that appears to support earlier findings based on the possession index which suggested that the general level of family wealth is low.

General Policy Concern 2:

What were the school context factors experienced by Standard 6 pupils (such as location, absenteeism (regularity and reasons), standard repetition, and homework (frequency, amount, correction, and family involvement)) that might impact upon teaching/learning and the general functioning of schools?

What was the location of the school?

In Tanzania, government policy is that there must be a primary school in every village and a secondary school in every ward. Local communities in collaboration with local government authorities build schools according to the needs of the community. This policy decision was made to enforce the policy on provision of education to all children as a basic human right and to widen access to secondary education for the population in potential demand. The government also strives to provide health care, water, communication and all-weather roads, among other social amenities, to its people.

Distance that pupils walk or travel to access basic amenities such as a health centre, public library, a tarmac road, and a bookshop, is an important factor contributing to a pupil-friendly learning environment. When some of these amenities (e.g. library and bookshop) are within easy reach they assure the pupil of additional sources of reading material besides the school and the home. They can also ascertain the physical well-being of the pupil, as is the case of a health centre. If there are good roads, schools become more easily accessed and therefore are supported by the centre or district offices. Schools that are more easily accessible also attract and retain good teachers. On the other hand, the presence of a secondary school in the vicinity of primary schools motivates primary school pupils to work very hard in order to secure a smooth transition to the secondary education. However, the availability of such amenities varies between the rural and the urban settings, and often the rural areas have less of these, making pupils in the rural settings relatively disadvantaged. In this study it was thus considered important to collect information on the location of schools with respect to rural and urban location and their proximity to the various amenities.

Head teachers were asked to indicate where their schools were located using a 4-point scale as follows: ‘1’ = isolated; ‘2’ = rural; ‘3’ = semi-urban; ‘4’ = urban. The variable was re-coded to indicate “rural” and “urban” location of schools. The results of their responses have been presented in Table 3.6.

Table 3.6. School location

Zone	Urban		Distance (km)	
	%	SE	Mean	SE
Central	21.1	11.19	15.2	3.60
Eastern	70.1	12.05	14.7	6.57
Kagera	14.6	9.90	11.2	1.96
Kilimanjaro	6.4	6.42	12.0	1.40
Mwanza	23.5	12.71	14.8	3.80
Northeast	21.3	11.52	11.2	2.85
Northern	24.7	11.75	20.2	5.29
Southern Highlands	46.3	14.29	15.8	3.74
Southern	5.7	5.90	19.9	7.62
Southwest	12.5	9.08	13.9	4.82
Western	28.7	12.46	19.0	5.46
Tanzania	28.6	4.04	15.9	1.49

In Table 3.6 it can be seen that 28.6 percent of Standard 6 pupils were attending schools that were in urban areas while 71.4 percent were attending schools that were in rural areas. Eastern zone had the highest percentage of schools located in urban areas (70.1 %). In contrast, Southern and Kilimanjaro zones had the lowest percentages of schools located in urban areas, these being 5.9 and 6.4 percent respectively.

Distance to school

Head teachers were asked to indicate the distance to school from each of the nearest following amenities: a health centre, public library, a tarmac road, a bookshop, the nearest secondary school and a shopping centre. Mean distance was established by adding each of the distances and dividing by 5.

In Tanzania the mean distance travelled by pupils from school to the amenities was 15.9 kilometres. This implies that Standard 6 pupils covered more than 2 times the distance they were expected to walk to and from school (that is, the Ministry norm of 7 kilometres)

whenever they sought to access the listed amenities. There were large variations in this variable across the zones, with the highest mean of 20.2 kilometres in Northern Zone and 19.9 and 19 kilometres in Southern Zone and Western Zone respectively. On the other hand, Kagera and North East Zone had the lowest means of 11.2 kilometres each followed by Kilimanjaro which had a mean distance of 12.0 kilometres.

These results reflect a mixed picture of the expected results where it was not always the case that the amenities were easily accessible in the urban areas and vice versa. For instance, whereas Kilimanjaro was among the most rural zones, its schools were closest to the amenities, way ahead of Eastern Zone which was about 70 percent urban but had a mean distance of 14.7 kilometres between its schools and the amenities. The long distances that pupils travelled to the amenities in the Northern, Southern and Western Zones are disturbingly high, and future national plans on supplying these amenities should prioritise these zones.

Policy suggestion 3.10. The Ministry, in collaboration with PORALG, local authorities, and the communities in Northern, Southern and Western Zones, should establish secondary schools and other basic amenities preferably at ward level, supply schools in these zones with libraries, first aid kits, in order to reduce average walking distances of pupils accessing these facilities and promote pupils' motivation and well-being.

How frequently did pupils receive homework in reading and mathematics?

Homework is associated with increased pupil achievement. It is important that it forms part of the basic learning experience of pupils and that it increases as pupils ascend the school system. The Ministry requires teachers to give pupils homework and correct it regularly since homework is among the basic tasks in tracking pupils' levels of mastery in the skills taught. An assessment of the frequency of homework assigned to pupils was made by asking pupils how often they received homework. Their responses ranged from no reading homework, one or two times per month, two times per week and most of the days. The results from their responses have been presented in Table 3.7(a).

Table 3.7(a). Percentages and sampling errors for the frequency of homework given most days

Zone	Reading homework		Mathematics homework	
	%	SE	%	SE
Central	54.8	6.30	47.8	5.62
Eastern	54.9	4.44	52.2	5.11
Kagera	58.5	4.88	56.4	5.15
Kilimanjaro	72.3	3.83	70.9	4.48
Mwanza	50.8	9.70	54.3	6.82
Northeast	51.7	5.15	53.6	4.60
Northern	52.7	5.54	50.9	5.82
Southern Highlands	64.9	4.99	63.9	6.93
Southern	48.8	5.54	32.4	7.41
Southwest	53.7	5.46	45.8	6.22
Western	56.5	7.42	57.5	5.88
Tanzania	56.6	1.92	54.1	1.99

In Table 3.7 (a) it is noted that in Tanzania 56.6 percent and 54.1 percent of Standard 6 pupils received homework in reading and mathematics respectively most of the days. The frequency of giving homework in reading and mathematics did not vary much, although pupils received slightly more homework in reading than in mathematics. However, there were considerable variations among the zones with regard to the frequency with which pupils received homework. Kilimanjaro had the highest percentage of Standard 6 pupils who received homework most of the days in reading (72.3%) while the Southern Zone had the lowest average of 48.8 percent. When compared to other zones, Kilimanjaro and Southern Highlands Zones had considerably higher averages of 70.9 percent and 63.9 percent respectively of Standard 6 pupils who stated that they received homework most of the days in mathematics. By contrast, Southern Zone had the lowest average of 32.4 percent. The results also suggest that the zones which had the highest averages and lowest averages respectively in the provision of homework in reading reflected a similar pattern in mathematics.

The variations among zones in the provision of homework need to be addressed in order to ensure that all pupils have equal opportunities to learn and to master the skills taught.

Did the teachers correct assigned homework?

Pupils were asked to indicate how frequently their reading teacher had corrected their homework, and their responses have been presented in Table 3.7(b). Their responses ranged from ‘no homework given’, ‘never corrected’, ‘sometimes corrected’ to ‘mostly/always corrected’.

Table 3.7(b). Percentages and sampling errors for the frequency of reading homework being corrected by teacher

Zone	No homework given		Never corrected		Sometimes corrected		Mostly/always corrected	
	%	SE	%	SE	%	SE	%	SE
Central	21.8	4.27	3.0	1.16	16.7	2.90	58.5	4.83
Eastern	18.3	3.32	5.1	1.74	14.6	3.04	62.0	4.40
Kagera	20.4	4.28	3.7	1.52	15.3	1.90	60.7	4.07
Kilimanjaro	9.6	2.21	8.0	1.96	6.6	2.03	75.9	3.73
Mwanza	13.6	4.00	4.3	1.69	25.5	4.47	56.6	6.64
Northeast	21.8	4.29	6.1	2.53	13.2	2.71	58.9	4.19
Northern	18.3	4.10	9.8	1.82	15.0	2.63	56.9	3.74
Southern Highlands	11.6	2.39	5.4	1.85	7.5	2.05	75.5	4.45
Southern	22.5	6.17	2.9	1.30	15.5	5.41	59.0	10.76
Southwest	22.7	3.94	8.5	2.44	15.1	3.77	53.8	5.70
Western	21.3	4.80	4.7	1.31	13.8	2.64	60.2	6.68
Tanzania	17.8	1.20	5.8	0.57	14.0	0.98	62.5	1.70

In Tanzania 62.5 percent of Standard 6 pupils had their reading homework mostly/always corrected by their teacher. There were slight variations among the zones in the frequency of correcting pupils’ reading homework. Kilimanjaro zone had the largest percentage of pupils with their homework mostly/always corrected, with the mean of 75.9 percent. Southern Highlands Zone also had a relatively high mean of 75.5 percent. On the other

hand, Southwest Zone had the lowest percentage of pupils with their homework mostly/always corrected (53.8%).

In columns 2, 3 and 4 of the Table 3.4(b), it can be seen that Standard 6 pupils who stated that they did not receive any homework at all were 17.8 percent whereas 5.8 percent and 14.0 percent respectively had their homework never corrected and sometimes corrected.

With these results it would appear that about 37.0 percent of Standard 6 pupils (that is, those not given homework 17.8 %, those whose homework was never corrected 5.8 % and those whose homework was sometimes corrected 14.0%) were disadvantaged in this regard because the teachers did not ascertain that they mastered the skills that were taught during the lessons.

Table 3.7(c). Percentages and sampling errors for the frequency of mathematics homework being corrected by teacher

Zone	No homework given		Never corrected		Sometimes corrected		Mostly/always corrected	
	%	SE	%	SE	%	SE	%	SE
Central	26.1	4.04	10.6	2.62	17.5	2.88	45.8	4.35
Eastern	14.1	3.04	12.0	2.50	18.4	3.44	55.5	4.50
Kagera	19.2	4.24	12.8	3.25	21.8	2.88	46.1	3.94
Kilimanjaro	6.1	2.11	13.1	2.53	15.1	3.05	65.7	4.38
Mwanza	5.4	1.69	10.0	3.76	27.7	5.64	56.9	6.37
Northeast	25.7	4.19	12.1	2.34	14.8	2.13	47.4	4.11
Northern	18.2	4.81	15.4	1.78	19.6	2.95	46.8	4.75
Southern Highlands	8.2	3.35	5.9	2.05	14.1	2.38	71.8	5.61
Southern	20.9	7.09	7.7	4.22	25.4	4.34	46.0	11.11
Southwest	18.1	4.91	15.6	3.25	21.1	4.75	45.2	7.39
Western	20.4	4.43	10.1	2.59	24.5	3.17	45.1	7.20
Tanzania	16.1	1.34	11.0	0.84	19.4	1.05	53.5	1.91

In Table 3.7 (c) it can be seen that in Tanzania 53.5 percent of Standard 6 pupils had their mathematics homework mostly/always corrected.

In columns 2, 3 and 4 of the table it can be seen that about 16 percent of Standard 6 pupils were not given any homework whereas 11.0 percent and 19.4 percent respectively stated that their homework was never corrected or corrected only sometimes.

There were large variations among the zones with regard to the correction of mathematics homework. Southern Highlands had the largest percentage of Standard 6 pupils whose homework was always/mostly corrected (71.8%). South west and Western zone had the lowest percentages of pupils answering that their homework was always corrected, with means of 45.1 percent and 45.2 percent respectively.

While there was little variation nationally in the proportion of pupils who responded that they were not given homework, for both reading and mathematics (17.8% and 16.1% respectively), their homework was slightly more regularly marked in reading (62.5% always corrected) than in mathematics (53.5% always corrected). It is interesting to note also that the percentage of pupils whose homework was never corrected in mathematics was about twice that for reading (11.0 %, against 5.8 %). These results appear to suggest that mathematics teachers were less keen in giving and correcting pupils' homework than their Kiswahili counterparts.

Policy suggestion 3.11. The Ministry should investigate why in some zones teachers do not give homework, especially in the Central and Northeast Zones in mathematics and Southern, Southwest, Northeast, and Central Zones in reading. The Inspectorate should revisit the homework norm on the frequency of homework and on the basis of results of their investigation, devise a monitoring mechanism with the school administration and the ward education coordinators that will ensure that homework is regularly given, corrected and used for continuous assessment of pupils.

Did family members monitor, assist with, request demonstrations, ask questions about, and/or look at, pupils' homework?

Home assistance with school related work

Research evidence indicates that home background variables of pupils, which include the level of education of parents, parental interest, father's socio-economic level, affect pupils' achievement at school (Heyneman and Loxley, 1983).

Pupils were asked how often they received assistance with school related work by someone in their home. Their responses ranged from: 'do not get homework', 'never', 'sometimes' and 'most of the time'. The analyses for 'most of the time' with school work responses have been presented in Tables 3.8 (a) to 3.8 (c).

Table 3.8(a). Home assistance with school related work

Zone	Home assistance ‘most of the time’ with school work					
	Ensure homework done		Help with the homework		Look at school work done	
	%	SE	%	SE	%	SE
Central	65.8	5.33	49.2	4.97	46.6	4.82
Eastern	66.2	4.31	51.8	5.78	49.4	4.37
Kagera	65.6	3.79	58.4	4.11	44.6	5.00
Kilimanjaro	68.5	4.10	49.5	5.24	57.6	5.58
Mwanza	56.9	8.20	50.8	8.06	43.1	9.32
Northeast	62.9	4.22	53.3	4.72	46.4	5.43
Northern	60.9	5.50	48.8	5.15	46.5	5.09
Southern Highlands	60.5	7.32	46.6	6.10	40.8	7.77
Southern	57.9	3.44	55.4	5.58	38.6	4.97
Southwest	45.0	5.70	38.1	7.34	37.0	4.43
Western	56.7	6.96	50.2	7.86	50.6	7.32
Tanzania	60.8	1.89	49.8	1.89	45.6	1.95

It can be seen from Table 3.8 (a) that, on average, 60.8 percent or nearly two-thirds of Standard 6 pupils came from families who ensured that the homework assigned to their children was done. There was little variation among the zones, except for Southwest Zone which had a particularly low percentage (45.0%).

The percentages of pupils from homes where help with homework was provided most of the time are reflected in column 3 of Table 3.8 (a). The national average was 49.8 percent, and the variations among the zones were fairly large. The variations ranged from South Western Zone where the average was 38.1 percent to Kagera Zone where the average was 58.4 percent.

In column 3 of the table, it can be seen that the average for Tanzania for homes that looked at school work done was 45.6 percent. Once again the variations among the zones were not very large except for South West Zone whose mean was particularly low (37.0%) and

Kilimanjaro Zone which was high (57.6%). It can be concluded from the national results that for every 10 pupils in Tanzania primary schools 5 pupils received home assistance of some form in their homework, which leaves the other 5 without any help provided. The school system therefore needs to be more proactive by assisting pupils with their homework since many homes do not provide for this. On the other hand, parents and guardians also need to be sensitised on the importance of providing their children with assistance when they do homework.

Further analysis of the response 'most of the time' with regards assistance with reading and mathematics work was made, and the results have been presented in Tables 3.8 (b) and 3.8 (c).

Table 3.8(b). Home assistance with reading work

Zone	Home assistance 'most of the time' with school work			
	Ask to read		Questions on school reading work	
	%	SE	%	SE
Central	46.9	4.04	41.8	3.56
Eastern	40.4	5.19	54.5	4.02
Kagera	45.2	4.17	43.2	5.17
Kilimanjaro	48.1	4.83	54.0	5.57
Mwanza	41.2	7.27	43.3	7.76
Northeast	42.4	3.69	40.4	4.89
Northern	39.5	4.59	43.4	5.13
Southern Highlands	29.4	5.37	35.6	6.08
Southern	30.4	3.06	32.3	4.46
Southwest	29.2	4.55	37.1	4.77
Western	49.2	7.13	50.2	6.58
Tanzania	39.6	1.59	43.1	1.69

The average percentage of Standard 6 pupils in Tanzania from homes where someone asked them to read was 39.6 percent. There was not much variation among the zones except for Southwest and Southern Highlands Zones which were notably low where only 29.2 percent

and 29.4 percent respectively of standard 6 pupils indicated that they were asked to read at home.

On whether someone at home asked ‘questions on school reading work’, the average percentage of pupils getting such support, as seen from column 2 was 43.1 percent. There were slight variations among the zones with Southern Zone notably low with an average 32.3 percent and Eastern Zone and Kilimanjaro Zone particularly high at 54.5 percent and 54.0 percent respectively.

Table 3.8 (c). Home assistance with mathematics work

Zone	Home assistance ‘most of the time’ with school work			
	Do mathematical calculations		Questions on school mathematics work	
	%	SE	%	SE
Central	55.1	5.10	45.8	5.87
Eastern	58.4	5.31	51.6	5.85
Kagera	43.7	5.08	45.9	5.45
Kilimanjaro	54.9	5.00	52.9	5.96
Mwanza	45.8	7.83	46.2	8.21
Northeast	47.9	6.26	44.8	4.51
Northern	46.7	5.39	41.3	5.03
Southern highlands	37.9	8.79	40.0	7.96
Southern	31.3	6.24	23.0	5.50
Southwest	29.0	5.56	27.4	3.27
Western	45.7	8.29	46.6	7.82
Tanzania	45.5	2.07	42.7	2.02

In mathematics, the national average for those Standard 6 pupils who received ‘home assistance most of the time with doing mathematical calculations’ was 45.5 percent. Variations among the zones ranged from Southwest which had a low average (29%) to Eastern Zone which had the highest average (58.4%). The national average for ‘home assistance most of the time with questions on school mathematics work’ was 42.7 percent.

There were wide variations among the zones for “home assistance most of the time with doing mathematical calculations”. The average was particularly low in Southern Zone which had 23.7 percent and Southwest Zone which had 27.4 percent. On the other hand, Kilimanjaro and Eastern Zones had high averages of 52.9 percent and 51.6 percent respectively. The zones with particularly low or high averages in reading had similar performance in mathematics.

Overall, the results in Tables 3.8 (a) to 3.8(c) show that between 4 and 6 parents out of 10 showed some form of interest in their children’s school work. There was a need therefore for school management bodies to mobilise parents in providing their children with more home support on their school work.

Policy suggestion 3.12. The school inspectorate department should ensure that school committees and parent-teacher meetings regularly encourage parents and guardians to provide children with assistance with homework. A system of a where the parent signs to show that she/he has assisted the child should be established to commit parents in this regard.

General Policy Concern 3:

Did Standard 6 pupils have sufficient access to classroom materials (for example, textbooks, readers, and stationery) in order to participate fully in their lessons?

Some studies have shown those pupils who were in schools with school libraries, many classroom facilities, teachers who used modern teaching methods, gave frequent tests and regular homework achieved higher. In addition, increasing pupils’ access to books by making them closer to ordinary classroom activities is a key factor in improving pupil literacy levels (Postlethwaite and Ross, 1992). The Ministry norm for classroom supplies include that every pupil should have an exercise book, a pencil, a pen, a ruler, an eraser, and a mathematical set. In addition, three pupils should share one textbook. Notebooks are not compulsory and mathematical sets are used by higher classes (Standards 3 to 7).

In this study, an assessment was made of the provision of learning materials including textbooks, exercise books, note books, pens, pencils and erasers by asking Standard 6 pupils to indicate which of the listed material they possessed. It is worth noting that an exercise book is defined as a book for writing work which is marked by the teacher and a notebook as

a book for writing work that is not marked by the teacher. The results of the analyses on the availability of the learning materials have been presented in Table 3.9, 3.10 (a) and 3.10 (b)

What percentage of pupils had reading and mathematics textbooks?

Pupils reading text books and materials in the classrooms

The textbook is one of the key items children should have if they are to learn effectively. In an ideal situation, every child should have a textbook, but in Tanzania the stated norm is that every three pupils may share a textbook. The percentages of pupils with own reading textbook and own mathematics textbook have been presented in Table 3.9.

Table 3.9. Percentages and sampling errors for pupils having own reading textbook

Zone	Own reading textbook		Own mathematics textbook	
	%	SE	%	SE
Central	3.7	1.18	5.2	1.83
Eastern	10.2	2.44	8.6	2.39
Kagera	6.3	2.30	7.9	2.07
Kilimanjaro	3.3	1.52	3.7	1.66
Mwanza	7.2	1.90	10.2	3.50
Northeast	4.7	1.39	3.7	1.65
Northern	9.0	2.05	11.0	1.88
Southern Highlands	3.8	1.57	4.7	2.29
Southern	4.8	2.69	4.2	3.35
Southwest	5.3	1.48	5.1	1.62
Western	6.1	1.36	8.1	1.57
Tanzania	6.0	0.56	6.8	0.67

In Tanzania, six percent of Standard 6 pupils indicated that they had their own reading textbooks while around seven percent of them indicated that they had their own mathematics text books. In other words, between 93 and 94 percent of Standard 6 pupils did not have their own reading or mathematics textbook. Although the Ministry norm would still expect three

children to share a textbook, one would expect this norm to be the absolute minimum. In that sense, the results presented in Table 3.9 were expected but very worrying.

There were large variations among zones, with the Eastern zone having the highest average of 10.2 percent of pupils who stated that they had their own reading text book, and Kilimanjaro which had the lowest percentage of pupils who stated that they had their own Reading text book (3.3%).

Northern Zone had a significantly high percentage of Standard 6 pupils who indicated that they had their own mathematics textbook (11.0%) followed by Mwanza Zone which had 10.2 percent. The lowest percentages of Standard 6 pupils with their own mathematics textbooks were in Kilimanjaro and Northeast Zones (3.7% each).

The high figure for the Eastern Zone which includes Dar es Salaam city was expected because there are relatively more inhabitants who belong to the working class who are therefore more likely to afford to buy textbooks for their children. On the other hand, it was surprising that Kilimanjaro Zone had the lowest figures of pupils with their own textbooks for both reading and mathematics. One would have expected to get a very high percentages of pupils in this zone with own textbooks given that the zone is among those that are well developed, and its inhabitants are generally aware of the value of education.

The results for textbook supply reflected a worrying situation and appear to support findings of many school map surveys where the pupil: textbook ratio was as high as 1:6 in many subjects. However, the situation has begun to change with the implementation of PEDP where the average pupil textbook ratio for lower standards (1 to 4) had gone down to 3:1 during year 2002, but have nonetheless remained high, varying between a ratio of 1:4 and 1:5 for higher standards (PEDP Annual Report, 2002; ILO, 2002).

Exercise books, Notebooks and Pencils

The results of the analyses for pupils with no exercise books, notebooks and pencils have been presented in Table 3.10 (a).

Table 3.10(a). Percentages and sampling errors for shortages of basic classroom materials: exercise books, notebook, and pencil.

Zone	Exercise books		Notebook		Pencil	
	%	SE	%	SE	%	SE
Central	4.9	2.20	63.6	6.32	19.7	3.86
Eastern	1.2	0.93	59.8	7.13	14.3	3.03
Kagera	4.0	1.05	59.7	6.98	18.4	5.37
Kilimanjaro	0.0	0.00	53.3	7.01	7.1	3.34
Mwanza	4.9	1.89	59.4	6.56	12.9	4.06
Northeast	0.8	0.82	69.2	4.64	14.7	3.05
Northern	1.9	1.43	43.7	8.28	8.2	2.29
Southern Highlands	3.8	1.33	52.0	6.22	9.2	2.84
Southern	1.6	1.04	49.9	12.48	12.7	5.95
Southwest	4.5	2.30	63.9	5.77	25.6	6.96
Western	9.5	3.18	60.6	6.74	23.7	4.96
Tanzania	3.4	0.54	56.5	2.26	14.1	1.17

In Tanzania, only 3.4 percent of Standard 6 pupils reported that they did not have exercise books whereas 56.5 percent reported that they did not have notebooks while 14.1 percent did not have pencils.

Western Zone had relatively high percentages of pupils who reported that they did not have exercise books (9.5 %). The Northeast Zone had a particularly high number of pupils with no note books (69.2 %) whereas Southwest Zone had the largest percentage of pupils who reported that they did not have pencils (25.6%). Kilimanjaro had relatively low percentages of pupils who responded that they did not have pencils (7.1%) and no Standard 6 pupils (0.0%) lacked an exercise book. North Eastern Zone also had very low percentages of pupils with no exercise books (0.8%).

The national averages for the three items appear to reflect the importance that was accorded to them by parents. As expected, exercise books had the most importance. The relatively high figure for pupils with no pencils contrary to the expectation that the average figure should be

comparable with that for exercise books due to their compatible use could be presumably due to the fact that since pencils are not as often used as pens in higher classes in primary education, their acquisition was not of top priority among pupils.

What percentage of pupils had adequate basic classroom supplies for writing, ruling, erasing, etc.?

The results for Standard 6 pupils who reported that they lacked a pen, an eraser and a ruler have been presented in Table 3.10 (b).

Table 3.10(b). Percentages and sampling errors for shortages of basic classroom materials: eraser, pen, and ruler.

Zone	Eraser		Pen		Ruler	
	%	SE	%	SE	%	SE
Central	35.8	6.53	8.0	2.49	38.6	6.32
Eastern	27.2	6.85	3.7	1.57	27.9	6.37
Kagera	38.8	6.94	11.6	3.20	32.3	6.99
Kilimanjaro	25.6	6.69	4.5	1.88	17.0	4.96
Mwanza	31.2	6.10	5.5	1.87	28.7	4.67
Northeast	31.2	6.12	6.2	4.57	25.5	4.26
Northern	17.7	3.50	3.9	1.64	18.4	4.04
Southern highlands	24.4	6.11	7.0	3.30	20.4	6.01
Southern	40.8	11.14	5.6	2.49	22.2	7.16
Southwest	50.7	6.11	10.8	4.97	42.0	7.22
Western	30.3	6.23	11.1	4.01	35.5	4.93
Tanzania	29.7	2.01	6.7	0.94	26.7	1.78

The national mean for Standard 6 pupils who indicated that they did not have erasers was 29.7 percent while those who did not have a pen and those who did not have a ruler were 6.7 and 26.7 percent respectively. Thus most of Standard 6 pupils had a pen to write with (93.3 %) whereas relatively large numbers did not have rulers and erasers (26.7 and 29.7 % respectively).

Large variations were noted among the zones for all 3 items. For erasers, variations ranged from a high average of 50.7 percent in South West Zone to a low average of 17.7 percent in Northern Zone.

The largest percentages of pupils with no pens were in Kagera Zone (11.6 %). On the other hand, Eastern Zone had the lowest percentages of pupils with no pens (3.7%). The results for pupils reporting that they had no ruler ranged from a low of 17 percent in Kilimanjaro Zone to a high of 42 percent in South West Zone.

The results for classroom teaching/learning materials and classroom supplies indicated that they were generally inadequate and the situation in some zones was serious. It is desirable that the Ministry enforces its norms with regard to the provision of key learning materials.

Policy suggestion 3.13(a). The Ministry in collaboration with PORALG should conduct a census for all primary schools in order to establish the levels in the supply of learning materials and establish their demand. Capitation grants under PEDP should then be judiciously used to purchase the materials whose supply levels fall too far below the official norms.

Policy suggestion 3.13(b). The Ministry in collaboration with PORALG should mobilise parents and school committees so that they can contribute additional resources towards the procurement of classroom of those supplies that cannot be covered through capitation grants.

General Policy Concern 4:

Did Standard 6 pupils have access to library books within their schools, and (if they did have access) was the use of these books being maximized by allowing pupils to take them home to read?

In many schools where schools library facilities exist, the borrowing of textbooks can be limited because of the inadequate supply of textbooks or other readers. Therefore schools end up with school policies on borrowing that are protective of textbook life rather than policies that promote a reading culture. In this study, pupils and head teachers were asked to indicate if pupils were allowed to take books home to read. The analysis of their responses has been summarized in Table 3.11.

Table 3.11. Percentages and sampling errors for pupil and school head responses to whether pupils are permitted to borrow books from a classroom or a school library.

Zone	Pupil		School Head	
	%	SE	%	SE
Central	69.2	6.68	83.4	17.59
Eastern	67.3	6.05	0.0	0.00
Kagera	89.5	2.74	90.7	9.38
Kilimanjaro	82.9	3.89	100.0	0.00
Mwanza	80.4	6.17	100.0	0.00
Northeast	67.6	5.79	0.0	0.00
Northern	81.2	3.04	100.0	0.00
Southern Highlands	55.8	7.97	15.9	32.65
Southern	56.9	19.15	100.0	0.00
Southwest	75.2	7.51	100.0	0.00
Western	78.1	3.17	100.0	0.00
Tanzania	72.0	2.36	79.4	12.48

Nationally, 72.0 percent of Standard 6 pupils were in schools that allowed them to borrow books from the library. Some 79.4 percent of Standard 6 pupils were in schools where the head teacher indicated that pupils were allowed to borrow books from the library for home reading. Interestingly, head teachers in Northeast and Eastern zones indicated that pupils were not allowed to borrow books from the library (0.0% each) although pupils indicated that they were allowed to do so (67.6% and 67.3% respectively). Generally, the results show that pupils were allowed to borrow books from the classroom or school library. However, the results are only referring to a small proportion of Standard 6 pupils since in later findings in Chapter 5 only 20 percent of schools had libraries. In addition, the figures for pupil responses when compared to those of head teachers' responses across the zones did not often match, which could probably be explained by the absence of a clear, school policy on borrowing books, or the total absence of any policy in this regard. In such a situation it would appear that school systems should rework their library systems and establish them where they are non existent.

Since the government has embarked on the ambitious PEDP where the supply of textbooks is a priority, it is imperative that the supply of the facility be extended to include books and library books not only for use by pupils at school but for them to borrow for use at home.

Policy suggestion 3.14. The Ministry in collaboration with PORALG and Tanzania Library Services should ensure the establishment of school libraries in all schools, initially through the thrifty use of PEDP funds, and ensure that schools formulate book borrowing policies for books in schools including those kept in libraries.

General Policy Concern 5:

Has the practice of Standard 6 pupils receiving extra lessons in school subjects outside school hours become widespread, and have these been paid lessons?

In Tanzania there has been, over the years, a shift of in-depth teaching/learning during regular lesson periods within school hours to extra lessons in school subjects outside the official school day (tuition classes). The majority of the teachers who provide this type of tuition demand a fee from pupils as a condition for attending such extra tuition lessons. The practice was checked by the issuance of a Ministry circular in 1999 which allowed tuition for remedial purposes only.

What percentage of pupils received extra tuition?

The responses on whether they took extra tuition outside school hours have been presented in Table 3.12 (a).

Table 3.12 (a). Percentages and sampling errors for the extra tuition taken by pupils outside school hours

Zone	Extra tuition on any subject	
	%	SE
Central	79.6	4.75
Eastern	91.4	2.09
Kagera	85.1	3.33
Kilimanjaro	90.1	5.69
Mwanza	88.6	2.79
Northeast	79.5	6.61
Northern	94.5	1.15
Southern Highlands	84.5	5.65
Southern	85.2	5.57
Southwest	75.1	5.35
Western	89.6	2.98
Tanzania	86.6	1.37

It can be seen that in Tanzania about 87 percent of Standard 6 pupils were in schools where they were receiving extra tuition in any subject. The variations among zones were small. Northern Zone had the highest percentage of 94.5 percent, followed by Eastern Zone, which had 91.4 percent. By contrast, Southwest Zone had the lowest percentage of 75.1 percent. This practice effectively enhances learning opportunities for those who can pay for extra tuition, but denies those who cannot pay for it even when they need it for remedial purposes. The practice is now so endemic that it is conducted both in and outside the school premises by teachers and other people who are not necessarily teachers. Communities, especially those in urban areas, send their children to tuition classes not because it is always necessarily a remedial measure, but because it has simply become a fashionable practice. Extra tuition is largely not monitored. As such, it can have various deleterious effects on learners.

Policy suggestion 3.15. The Ministry should investigate whether tuition was provided as a genuine remedial measure, what made it so prevalent, where it took place, and how the content and methodology used by teachers in tuition lessons compared with those employed in the normal lesson.

Was payment made for receiving extra tuition?

In Table 3.12 (b) the results on whether or not pupils paid for tuition classes have been presented.

Table 3.12 (b). Percentages and sampling errors for the payment of extra tuition taken by pupils outside school hours

Zone	There is payment		There is no payment		Don't know	
	%	SE	%	SE	%	SE
Central	31.0	7.20	54.7	7.08	14.2	3.41
Eastern	47.1	5.71	33.3	7.21	19.6	4.17
Kagera	43.5	5.77	49.2	4.99	7.4	2.67
Kilimanjaro	28.3	4.97	63.1	5.41	8.6	3.14
Mwanza	28.0	7.62	59.1	8.60	12.9	4.92
Northeast	45.4	4.99	31.0	3.48	23.6	5.21
Northern	39.7	7.12	46.2	6.45	14.1	3.44
Southern Highlands	37.2	7.48	49.3	6.24	13.5	4.41
Southern	15.9	7.21	70.2	10.47	14.0	4.97
Southwest	33.9	4.94	53.0	4.95	13.1	3.04
Western	38.5	10.56	39.7	8.35	21.9	5.71
Tanzania	36.1	2.38	48.5	2.30	15.4	1.38

In Tanzania, 36.1 percent of Standard 6 pupils indicated that they paid for tuition lessons and 15.4 percent of pupils did not know whether tuition lessons were paid for or not. Some 48.5 percent of them responded that there was no payment.

Eastern Zone had the highest percentages of Standard 6 pupils who indicated that they paid for tuition (47.1%) while Southern Zone had the lowest percentages of 15.9 percent.

Southern Zone had the largest percentage of Standard 6 pupils who indicated that they did not pay for tuition (70.2%) Although extra tuition was an additional source of income for

teachers and all those practising it, extra tuition also deprives the teacher of the time he or she needs in order to go through pupils assignments and to prepare for the next day's lessons.

These results show that there was widespread provision of tuition lessons outside school hours and that in about a third of the cases; payment was made for the tuition lessons. The high percentages of pupils who were receiving tuition raises concern on how much time teachers were actually devoting to effective teaching during school hours and to preparing for the next day's lessons. It takes away pupils' time-on-task, pupils' time for rest and recreation, and reduces the length of the school year. The figures for pupils receiving tuition indicate non adherence to the Ministry circular of 1999 on the control of tuition.. If we accept that the official time allocated for teaching is adequate, then the fact that teachers have to offer extra tuition to the vast majority of their pupils suggests that they are failing to teach effectively. Furthermore, a large proportion of those pupils who take extra tuition are required to pay for it. Given this scenario, it might be reasonable to suggest that teachers deliberately put up a lower-than-expected performance so that they may create a demand for extra tuition, and thus enrich themselves out of it.

Policy suggestion 3.16. The Ministry should establish whether there is a genuine need for extra tuition and, in those cases where it is necessary, regulate it so that the costs involved do not disadvantage those children who need it most. Furthermore, the Ministry must ensure that teachers do not take advantage of this practice for unfair personal gain.

Conclusion

The aim of this chapter was to present to the reader Standard 6 pupils' characteristics and their learning environment. They included personal characteristics and school context factors. The characteristics included their age, sex, days absent, frequency of their meals per week, standard repetition. Home characteristics included possessions in the home, books in the home and home assistance with schoolwork, while school characteristics included distance travelled to school, classroom supplies, the giving and correction of homework. The presentation of this information was considered to be important for the proper contextualisation of subsequent analyses. Furthermore, since levels and distribution of data may change over time, the data could be used to compare types of Standard 6 pupils at different time periods. Finally, the home characteristics of pupils were considered important for all education analyses without which the pristine relationship of other variables like school and teacher characteristics on pupils' achievement would be less telling.

Findings revealed that Standard 6 pupils were older than would be expected compared to the official age. The Ministry's move to enforce compulsory enrolment to school of all children of age 7 each year and to enrol overage children in a specially tailored program (COBET) beginning year 2002 was commendable but it was suggested that measures must be put in place to ensure that these efforts will be sustained. Other suggestions were made following the presentation of results in this chapter. It was suggested that the Ministry in collaboration with Ministry of Community Development, Children, and Gender, Ministry of Social work, Labour and Sports should investigate the many disparities and identify options for addressing them, including the design and implementation of community-based mechanisms that would eliminate the gender gaps which appeared more pronounced in Kagera, Central, Kilimanjaro and Northeast Zones.

A policy suggestion was made that the Ministry should provide schools with adequate books and ensure a system of borrowing books for pupils in order to address the shortage of textbooks in schools. This was all the more important because, generally, there were few books in pupils' homes. It was further recommended that Education Cluster Centres which have been established in 6 districts under WABEM offer alternative opportunities for pupils and adults to access books and audio/video teaching/learning materials. Such centres should therefore be consolidated and replicated country wide.

Satellite schools should be opened where schools served wider catchment areas than was permissible, and new schools should be opened according to the recommendations of school map exercises.

The Ministry should facilitate the establishment by parents and teachers of mechanisms to assist pupils with their schoolwork at home, and school administration should ensure that pupils' work was corrected by teachers. Suggestions to improve school hygiene and the health of pupils by involving the communities and the Ministry of Health and to devise a system for the provision of mid-day meals in order to improve pupils' concentration in their studies were made. Finally, the need for an investigation into why tuition, especially that which was paid for, was rampant in the school system was emphasised so that appropriate regulatory measure could be put in place.

Chapter 4

Teachers' Characteristics and their Viewpoints on Teaching, Classroom Resources, Professional Support, and Job Satisfaction

Introduction

Teachers are and may continue to be the most valuable input that schools can have for the foreseeable future. This remains true even in this era characterised by the extensive use of information technology where computer and internet-assisted instruction is picking momentum as an alternative means to knowledge and skills production and delivery. The role of teachers in the socialization of learners, for example, can hardly be substituted by technological gadgets, however sophisticated they may be. It is also pertinent to note that in SACMEQ countries, modern technology still has not reached the majority of schools, and infrastructure to support information communication technologies (ICTs) is still weak. While other instruction support mechanisms should continue to be developed to facilitate pupil learning, the role of the teacher remains critical.

Teachers are defined by certain minimum initial characteristics pertaining to their general academic background, teacher training (pre- and on/in-service training), their teaching experience, and age. These characteristics and others have a big impact on the learning achievement of pupils. In this chapter, the focus is on teachers' personal characteristics and their working conditions, their viewpoints on the curriculum, the existing teacher support mechanisms and their assessment of what contributed the most to job satisfaction.

From the second half of the 1990s' onwards, the government policy on the recruitment of primary school teachers required all recruits to have at least a good ordinary secondary education background i.e. teachers who successfully completed 4 years of secondary education with at least 5 passes in their national Form 4 examination. Prior to this, some recruits only had 7 years of primary education. Such teachers found their way into teaching during the first few years following the introduction of universal primary education (UPE) in the mid 1970's. The introduction of UPE resulted in an unprecedented rise in enrolment which, in turn, created the need for more teachers than the system could supply. Teachers with only seven years of primary education were therefore recruited and given a 3-week

residential teacher training session in order to meet this demand. Aware of the diverse qualifications of serving teachers, the government has designed and implemented support programmes that cater for the needs of teachers from different academic backgrounds

Continuous improvement of teachers' skills contributes to improved performance. In pursuit of this goal, in 1986 the Ministry issued a directive to all districts to establish teachers' centres. Some local authorities implemented this directive and during the 1990s' some donors supported further efforts to implement the policy through the District Based Support to Education (DBSP) initiative that was introduced in a few districts. While the two initiatives focussed on the establishment of teachers' centres at the district level, the Ward Based Education Management (WABEM) initiative introduced in 1999 which focused on the establishment of resource centres at the ward level, and these were known as Education Cluster Centres (ECCs). Teachers, pupils and community members can easily access and share education resources widely using these ECCs, and can also use them for the exchange of experiences and preparation of teaching learning materials.

The inspectorate also contributes to improved teacher performance. In Tanzania, the inspectorate's traditional role was expanded in 1979 to include the advisory function through which inspectors provide teachers with professional support. Inspectors also act as agents of change, and facilitate the sharing of good practices across schools in a more teacher- and school-friendly manner. Furthermore, District and Regional Academic Officers and Resource Centre Facilitators also provide teachers with support and monitor their effectiveness.

The civil service government reform calls for good governance and some aspects under the reform include the decentralization of powers and responsibilities to the lower levels (regions, districts, community, and the school). Transparency is a critical factor in good governance, therefore viewpoints of teachers are important inputs that shape government policies, including those pertaining to teachers' working conditions and their job satisfaction.

The results presented in this chapter, it is hoped, will provide an assessment of teachers' qualifications, the scope of the effectiveness of the existing teacher support mechanism and their views on selected issues. They will provide evidence on the deployment of the teachers

across the zones, the support services and offer recommendations for consideration by the Ministry.

General Policy Concern 6:

What were the personal characteristics of Standard 6 teachers?

A number of variables, which were considered vital in assessing teacher characteristics namely age, gender, and socio-economic level and the condition of their housing, were assessed. The results of the analysis of teachers' responses have been reported in Table 4.1.

Table 4.1. Means, percentages, and sampling errors for age, gender, and socio-economic background of reading and mathematics teachers

Zone	Reading teacher						Mathematics teacher					
	Age (years)		Gender (female)		Possession at home (index)		Age (years)		Gender (female)		Possession at home (index)	
	Mean	SE	%	SE	Mean	SE	Mean	SE	%	SE	Mean	SE
Central	38.6	2.27	41.3	13.29	4.4	0.53	39.2	1.80	12.3	8.78	3.7	0.20
Eastern	35.6	1.89	81.7	10.08	4.7	0.56	33.3	1.69	57.5	12.70	4.0	0.42
Kagera	42.8	1.86	15.2	10.32	3.3	0.35	36.1	2.31	13.8	9.47	3.2	0.37
Kilimanjaro	38.5	1.74	70.3	13.00	4.3	0.30	38.1	2.28	25.0	11.44	4.3	0.25
Mwanza	34.9	3.37	62.4	14.95	2.8	0.52	36.0	2.14	15.4	10.74	3.7	0.66
Northeast	40.6	3.13	50.1	14.62	4.8	0.41	40.9	1.99	33.9	14.37	3.9	0.84
Northern	40.6	1.89	47.2	12.22	4.0	0.24	40.8	1.42	35.4	12.75	3.5	0.52
Southern Highlands	35.9	1.21	69.2	11.50	4.7	0.69	32.5	1.30	30.2	9.78	4.3	0.62
Southern	39.5	2.90	11.3	11.58	4.2	0.36	35.7	1.83	1.8	1.85	3.9	0.47
Southwest	37.8	1.64	46.0	14.90	4.1	0.46	38.3	1.84	4.3	4.36	4.0	0.41
Western	36.5	1.71	38.7	11.87	3.8	0.36	37.2	1.63	9.0	6.50	4.0	0.30
Tanzania	38.0	0.67	51.9	4.11	4.2	0.16	37.0	0.56	23.9	3.42	3.9	0.17

What was the age distribution of teachers?

The age of the teachers can be an important variable in pupil learning. Young teachers may be less experienced and therefore less effective in their teaching and classroom management, but they usually have not established set ways of teaching and can therefore adopt new, more effective teaching techniques. Young teachers also tend to be more active. On the other hand, older teachers are more experienced and more mature, both of which may be a big advantage in terms of teaching competency. However, they are less likely to adopt new teaching strategies, and may be less active. It is therefore important to examine the age of teachers.

The mean age of Standard 6 teachers in Tanzania in the sample was 38.0 years for reading teachers and 37.0 years for mathematics teachers. The difference between the mean ages for reading and mathematics teachers was not significant. However, the age range of teachers for each of the two subjects across the zones was large. Kagera Zone had the highest mean age of Standard 6 reading teachers (42.8 years) and the lowest mean age of 34.9 years was in Mwanza Zone. Likewise, the highest mean ages of mathematics teachers were in the Northeast and Northern Zones (40.9 and 40.8 years respectively) while the lowest mean of 32.5 years was recorded in the Southern Highlands. Overall, Standard 6 pupils were taught reading and mathematics by teachers who were middle-aged.

What was the gender distribution of teachers?

Ideally, schools – especially co-educational schools – should have a balanced representation of male and female teachers. This is because teachers can shape pupils' behaviour through role modelling, thus creating a boy-friendly and girl-friendly environment. Where all the teachers are females, for example, male pupils may fail to have a role model. There are other reasons. The presence of both male and female teachers offers better opportunities for the provision of guidance to male and female pupils alike. A system that has a big gender gap among teachers might reflect a history of subtle or overt gender-based discrimination, and this is a negative attribute. It is important, therefore, to examine the sex composition of teachers.

An analysis of the gender distribution of reading and mathematics teachers reveals two important points. The first is that, while there generally was gender parity with regard to reading teachers nationally (51.9% female), female mathematics teachers constituted a small minority of only 23.9 percent. The second is that the gender gap for both reading and mathematics teachers varied considerably across zones. In Southern Zone, the percentage of female teachers was only 11.3 percent and 1.8 percent for reading and mathematics respectively, and in Eastern Zone the corresponding figures were 81.7 percent and 57.5 percent.

The near equity between the percentages of female and male teachers who taught reading was expected given that in year 2000 female primary school teachers constituted 45 percent of all teachers in Tanzania (BEST, 2003). The gender distribution for mathematics teachers, however, portrays a picture that is very different from the national one because female teachers are seriously under-represented.

The particularly high percentages noted of female teachers in Eastern Zone for both subjects could be probably explained by the fact that the zone which included Dar es Salaam City, draws a lot of female teachers who follow their working husbands. By contrast, the very low percentages of female teachers in both subjects noted in the Southern Zone could probably be explained by the historic dislike of new teachers when posted to some districts in the Southern Zone due mainly to the poor infrastructure. However the review of recruitment policy in year 2000 where newly graduated teachers apply for teaching posts to local authorities of their choice rather than the old policy which guaranteed placement after their graduation has the potential to partly decrease the gender gap.

Policy suggestion 4.1(a). The Ministry and President's Office, Regional Administration and Local Government (PORALG) should review their teacher deployment policy in order to ensure a more equitable distribution of male and female teachers in schools.

The large national difference in the gender distribution of female teachers between reading and mathematics and the large gender variations among zones in both subjects could probably be explained in two ways. The first reason is the fact that while the recruitment policy of teacher trainees encourages both sexes to venture into the teaching profession and while primary school teachers are trained to teach all primary school curriculum subjects, far fewer female teachers appear to have opted to teach mathematics than male teachers. The

second reason is that there could be inequitable gender posting of teachers resulting in fewer female teachers than males in some zones. This situation is likely to create the perception among female and male pupils an attitude that mathematics is a subject that can be successfully pursued by males only. This therefore requires Ministry's attention.

Policy suggestion 4.1(b). The Inspectorate in collaboration with the Tanzania Institute of Education and Teacher Education Department should carry out a study on why female teachers do not opt to teach mathematics in primary schools and recommend corrective measures.

What was the socio-economic status of teachers in terms of possessions and livestock?

Teachers are likely to be de-motivated if they have a low socio-economic status in their communities. Teachers were therefore asked to indicate items that they owned out of a list of 13 items in order to reflect on their socio-economic status. If a teacher owned an item he or she was given a score of 1, and if he or she indicated that he or she did not possess it he or she was awarded a score of zero. If the teacher had all 13 items the score was 13, and it was 0 if he or she did not possess any of the items. The results of the analyses of their responses have been presented in Table 4.1 columns 3 and 7.

The average index for Tanzania was 4.2 items for reading teachers and 3.9 items for mathematics teachers. Thus nationally, Standard 6 teachers had around 4 out of 13 items, which appear to suggest that they were not well off.

There were considerable variations in the wealth of teachers among the zones in both subjects. In the Northeast Zone the mean index was high (4.8 for reading teachers). Other zones with high mean indexes were Eastern and Southern Highlands (mean index of 4.7 each). In Mwanza Zone the mean index was 2.8 for reading teachers, this being the lowest of them all. In mathematics the variations ranged from a mean index of 4.3 in Kilimanjaro to a low of 3.2 in Kagera, a range well within that reflected by reading teachers.

The relatively well off Standard 6 teachers in the three zones could be partially explained by the largely urban nature of the three zones which most presumably made it more likely for teachers to engage in additional economic activities.

Kagera zone had also rather low mean index of 3.3. It is a bit surprising to note that Mwanza teachers were particularly less well off despite the urban and commercial nature of the zone. It would be expected that teachers who were in urban settings would be relatively more well off than their rural counterparts because of the availability of opportunities for earning additional income.

Overall, results on the socio economic status of teachers did not appear attractive. These results, taken in association with those of the possessions in the homes of Standard 6 pupils presented in Chapter 3, show that teachers were marginally better off than pupils' families (in concrete terms, they possessed around one item more than pupils' parents did).

Policy suggestion 4.2. The Ministry in collaboration with PORALG should work out scheme where teachers can easily have access to financial capital for developmental purposes that can enhance their economic status. The ongoing Saving and Credit Cooperative Societies (SACCOS) national initiative should be speedily replicated nationwide in order to facilitate teachers' access, especially rural teachers, to financial capital.

What was the general condition (repair status and lighting) of teacher housing?

Teachers need to be well housed in order to have an enabling working environment. They need to prepare well for their lessons, mark pupils' work and to be assured of their personal security as well as the security of their families and possessions. In the study it was therefore vital to examine the living conditions of teachers, and so teachers were asked to indicate the condition of their houses. Their responses were in terms of the following variables namely: 'generally poor', 'required major repair', 'required minor repair' or 'were generally good'. The variables were recoded and their responses for the variable 'teacher housing in acceptable conditions' (that is requiring either minor repair or generally good) were analysed and their results have been presented in Table 4.2.

Table 4.2. Percentages and sampling errors for teacher housing in acceptable conditions

Zone	Teacher housing in acceptable conditions			
	Reading teacher		Mathematics teacher	
	%	SE	%	SE
Central	23.9	11.08	7.2	7.29
Eastern	28.5	9.04	34.5	11.11
Kagera	24.5	11.34	0.0	0.00
Kilimanjaro	18.3	10.06	23.7	11.01
Mwanza	2.7	2.72	0.0	0.00
Northeast	20.5	11.18	13.1	9.08
Northern	28.0	9.76	18.7	7.88
Southern Highlands	15.8	10.87	24.6	11.77
Southern	39.6	19.09	21.4	19.46
Southwest	23.6	13.83	0.0	0.00
Western	8.0	6.01	9.6	6.31
Tanzania	20.6	3.30	16.1	3.12

Nationally, 20.6 percent and 16.1 percent of Standard 6 pupils were taught by reading and mathematics teachers respectively who stated that they lived in acceptable conditions. These figures painted a picture that should be a cause for concern to Ministry.

There were variations among the zones for both mathematics and reading teachers. In Mwanza Zone, the percentage of teachers living in acceptable housing was particularly low (2.71%). Western Zone also had a low percentage of its teachers in acceptable housing conditions (8.0%). By contrast, Southern Zone was relatively much better off; with an average of 39.6 percent of its reading teachers who stated that they lived in acceptable housing conditions. In mathematics the disparity ranged from a high average of 34.5 percent of teachers who indicated that they lived in acceptable living conditions in the Eastern Zone to a low average of 0.0 percent each in the Southwest, Mwanza, and Kagera Zones. However the figures are associated with very high standard errors, and this shows that the statistics were not very stable.

The results showed that more than 70 percent of Standard 6 pupils were taught by reading and mathematics teachers who lived in unacceptable housing conditions. The government move to build teachers' quarters under PEDP which started in year 2002 is a good initiative that should be sustained beyond the lifespan of PEDP.

Policy suggestion 4.3. The Ministry in collaboration with PORALG should continue its efforts to improve teachers housing conditions through building more teachers' quarters and maintaining those that are in place. Special attention should be paid to those zones where teachers housing conditions are worst.

General Policy Concern 7:

What were the professional characteristics of Standard 6 teachers (in terms of academic, professional, and in-service training), and did they consider in-service training to be effective in improving their teaching?

Pre-service training, however short it may be, is essential for teachers because it enables new teachers to quickly master the basics of the profession. It equips the trainees with the state-of-the-art pedagogical skills, knowledge, values, and code of conduct. However, it is also important that all teachers, young and old, receive regular in- and on-service training if they are to meet the challenges of the ever-changing curriculum, the needs of the individual (pupil) and the needs of society. Good pedagogical skills and a sound academic background that is well beyond the level of the pupils they teach are crucial factors that positively influence teachers' performance. In-service training needs to be provided regularly in order enable teachers to keep track of the developments in education.

It is widely acknowledged that, with minor exceptions, teachers who have taught longest produce better results than those with limited experience. They have the advantage of having applied and perfected various pedagogical skills that they learned during training. Through in-servicing, practising teachers are likely also to have had the opportunity over the years to enhance their capabilities through learning new skills and adapting old ones to meet the demands of various educational innovations. These factors were considered important in the study and teachers were asked to indicate their professional qualifications, the level of their in-service training and effectiveness of the trainings they received. The results of their responses have been presented in Tables 4.3 up to Table 4.6.

How many years of teaching experience had teachers completed?

Table 4.3. Means and sampling errors for experience and training of reading and mathematics teachers

Zone	Reading teacher				Mathematics teacher			
	Experience (years)		Training (years)		Experience (years)		Training (years)	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Central	13.6	2.06	2.5	0.20	12.8	2.01	2.1	0.12
Eastern	12.5	1.90	2.2	0.09	10.4	1.53	2.1	0.08
Kagera	18.7	1.54	2.1	0.19	14.7	2.35	2.4	0.17
Kilimanjaro	15.9	1.76	2.2	0.11	14.8	2.29	2.2	0.18
Mwanza	9.9	2.40	2.0	0.20	12.2	2.09	2.3	0.35
Northeast	16.9	2.54	2.0	0.11	15.1	1.45	2.3	0.12
Northern	16.4	1.57	2.2	0.16	16.7	1.48	2.0	0.11
Southern Highlands	12.5	1.29	2.1	0.12	8.5	1.26	2.3	0.14
Southern	15.3	3.42	2.3	0.27	9.0	1.60	2.1	0.21
Southwest	14.2	2.08	2.3	0.13	12.5	2.21	2.2	0.14
Western	12.5	1.76	2.3	0.15	12.4	1.50	2.1	0.11
Tanzania	14.1	0.62	2.2	0.05	12.5	0.53	2.2	0.05

The national average of years of teaching experience for Standard 6 teachers was 14.1 years for reading teachers and 12.5 years for mathematics teachers. There was significant variation among zones in the mean years of teachers for both reading and mathematics. In Kagera Zone, reading teachers had a mean of 18.7 years, which was particularly high. The other zones which had relatively high means were North East (mean of 16.9 years) and Northern Zone (mean 16.4 years). On the other hand, Mwanza Zone had the lowest mean of 9.9 years.

The variation among the zones in mathematics ranged from a high mean of 16.7 years in Northern Zone to a significantly low mean of 8.5 years in the Southern Highlands Zone. Other zones with high means were Kilimanjaro (14.8 years) and Kagera (14.7 years). By contrast, Southern Zone had a mean of only 9 years and Eastern Zone a mean of 10.4 years.

Generally, zones with relatively low means in teaching experience for reading teachers' also had low means for mathematics teachers, and the reverse was true. This is probably explained by the possibility of many of the teachers taught both reading and mathematics. Overall, the results suggest that Standard 6 pupils were taught by slightly less experienced teachers in mathematics than in reading. The most experienced teachers were in Kagera Zone while the least experienced teachers were in the Southern Highlands Zone. The results for Kagera Zone could probably be explained by the fact that, unlike in the Southern Highlands Zone, Kagera is among the zones which attracts newly recruited teachers especially those originating from it. Once they are posted there they do not easily seek transfers out of the zone. Consequently, the teachers accrue long experience in same zone.

How many years of teacher training had teachers completed?

Teacher training for the majority of primary school teachers lasts 2 years. Over the years a variety of pre-service programmes had been introduced in order to meet the demand for teachers. Programmes included those lasting 2 years for trainees who completed Ordinary level secondary education (for Grade A teachers), 4 years for trainees who completed 7 years of primary education and were in the reserve list for joining secondary education (for Grade B teachers), 3 weeks for trainees who completed 7 years of primary education (for Grade C teachers), and 1 year residential training for trainees who completed Ordinary level secondary education (for Grade A teachers). In the study, teachers were asked to indicate the number of years they had spent in teacher training. In Table 4.2(b) the analyses of their responses have been presented.

The national average number of years of pre-service training for Standard 6 teachers for both reading and mathematics was 2.2 years.

There were insignificant variations among the zones. In reading, Central Zone had a mean of 2.5 years implying that there were more teachers who received longer pre-service courses than 2 years. Mwanza and Northeast Zones had each a low mean of 2 years of pre-service training which appears to suggest that a good number of teachers underwent a 2-year pre-service course.

In mathematics slight variations were observed between the high average number of years of pre-service training of 2.4 years in Kagera Zone and a low average of 2 years for Northern Zone. The range of training for mathematics teachers was similar to that for reading teachers.

In light of the different types of teacher training programs that different grades of teachers might have undergone, the results of an average of 2.2 years of teacher training would be expected. It is clear from the figures that Standard 6 teachers received in-service training.

How many years of academic education had teachers completed?

Standard 6 teachers were asked to indicate the academic education they attained, and they selected their responses from the following categories: 'primary', 'junior secondary', 'senior secondary', 'advanced level', and 'tertiary level'. The results of their responses have been presented separately in Table 4.4(a) and Table 4.4(b).

Table 4.4(a) Academic education of reading teachers

Zone	Primary		Junior secondary		Senior secondary		A-level		Tertiary	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	59.6	13.20	33.9	12.76	0.0	0.00	6.5	6.55	0.0	0.00
Eastern	10.2	7.10	83.3	8.01	2.9	2.89	3.6	3.64	0.0	0.00
Kagera	32.8	12.59	60.1	13.19	0.0	0.00	7.1	7.08	0.0	0.00
Kilimanjaro	29.2	11.80	70.8	11.80	0.0	0.00	0.0	0.00	0.0	0.00
Mwanza	24.2	11.94	75.8	11.94	0.0	0.00	0.0	0.00	0.0	0.00
Northeast	28.5	12.68	64.5	13.58	6.9	6.97	0.0	0.00	0.0	0.00
Northern	37.1	11.52	62.9	11.52	0.0	0.00	0.0	0.00	0.0	0.00
Southern Highlands	12.5	8.20	87.5	8.20	0.0	0.00	0.0	0.00	0.0	0.00
Southern	0.0	0.00	100.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Southwest	20.1	11.32	65.2	13.79	0.0	0.00	6.6	6.60	8.1	8.17
Western	26.5	10.81	68.4	11.41	0.0	0.00	5.0	5.07	0.0	0.00
Tanzania	25.2	3.34	71.3	3.45	0.9	0.70	2.1	0.96	0.5	0.45

Table 4.4(b). Academic education of mathematics teachers

Zone	Primary		Junior secondary		Senior secondary		A-level		Tertiary	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	0.0	0.00	100.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Eastern	1.8	1.77	92.0	6.39	6.2	6.24	0.0	0.00	0.0	0.00
Kagera	20.5	10.94	79.5	10.94	0.0	0.00	0.0	0.00	0.0	0.00
Kilimanjaro	11.5	7.98	88.5	7.98	0.0	0.00	0.0	0.00	0.0	0.00
Mwanza	3.2	3.23	95.2	3.60	0.0	0.00	1.6	1.62	0.0	0.00
Northeast	22.9	11.91	77.1	11.91	0.0	0.00	0.0	0.00	0.0	0.00
Northern	4.6	4.59	87.4	7.13	4.1	4.13	3.9	3.94	0.0	0.00
Southern Highlands	6.6	6.68	82.9	8.92	10.5	6.36	0.0	0.00	0.0	0.00
Southern	0.0	0.00	92.0	8.17	0.0	0.00	8.0	8.17	0.0	0.00
Southwest	16.5	12.56	77.0	13.36	0.0	0.00	6.6	6.60	0.0	0.00
Western	8.6	6.34	88.8	6.81	0.0	0.00	2.6	2.62	0.0	0.00
Tanzania	7.7	2.09	87.4	2.60	2.9	1.31	1.9	0.94	0.0	0.00

Nationally, 71.3 percent of Standard 6 pupils were taught by reading teachers who had completed junior secondary education, that is, two years of secondary education. Far fewer Standard 6 pupils had teachers who had completed primary education (25.2%), senior secondary education (0.9%), A- level (2.1%) and tertiary education (0.5%).

There were some variations among the zones in the academic education of Standard 6 teachers. For instance, all teachers (100 percent) in Southern Zone had junior secondary education while Central Zone had the highest percentages of teachers with lowest academic education, that is, 7 years of primary school (59.6%).

It can be inferred that the average Standard 6 pupil was predominantly taught by a teacher who had completed ten years of academic education. It was strange to note that only about 1.0 per cent of Standard 6 reading teachers had senior secondary education, which, in 2000, was the Ministry requirement for admission to pre-service teacher training. A much higher percentage of teachers with this level of education was expected. In addition, the high

percentage of teachers with low academic education of 7 years of primary school in the Central Zone made pupils in the zone particularly disadvantaged especially because these teachers should principally not be teaching the higher classes beyond Standard 4. The figures reflected a deficiency in meeting the ministry's benchmark that higher classes beyond Standard 4 should be taught by teachers with senior secondary education, that is, Grade A teachers.

Academic qualifications of mathematics teachers

It can be seen in Table 4.4 (b) that there were 87.4 percent of Standard 6 pupils with mathematics teachers who had completed junior secondary education. A very small percentage of Standard 6 pupils had mathematics teachers who had reached senior secondary and higher levels of education (4.8%). The variations among the zones were similar to those reflected in the results presented for reading. However, these results were associated with high standard errors of sampling, and so they were not very stable.

It is worth noting that a significantly higher percentage of Standard 6 pupils was taught by mathematics teachers who had reached junior secondary education (87.4 %) than those taught by reading teachers who had reached the same level (71.3 %). Furthermore, a much smaller percentage of Standard 6 pupils had mathematics teachers who had reached only primary level (7.7%) than they had reading teachers who had reached this level (25.2%).

On the basis of these results, it can be concluded that the average Standard 6 pupil had a mathematics teacher whose academic background was superior to his/her reading teacher. The ongoing pre-service training programme for primary school teachers where the minimum academic requirement is senior secondary education, and the upgrading in-service program for teachers with lower than senior secondary education should gradually address the problem. Nevertheless, the Ministry may wish to address the deployment of teachers in Central Zone so that more teachers with preferably senior secondary education are available to teach higher classes in primary schools.

How much in-service training had teachers completed?

Teachers were asked to give the number of in-service courses and the total number of days of the in-service courses they had attended during the past 3 years from the base year of the study (year 2000). Their responses have been presented in Table 4.5.

Table 4.5. Means and sampling errors for teacher in-service courses and days attended in the last three years

Zone	Reading teacher				Mathematics teacher			
	In-service courses		Days		In-service courses		Days	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Central	0.0	0.04	0.6	0.58	0.5	0.20	7.5	3.45
Eastern	0.3	0.15	8.2	5.96	0.5	0.24	5.3	2.54
Kagera	0.7	0.29	41.8	26.36	0.7	0.41	2.1	1.24
Kilimanjaro	0.6	0.22	23.6	13.64	0.6	0.23	34.6	20.52
Mwanza	0.5	0.25	27.4	21.18	0.1	0.09	0.5	0.37
Northeast	0.3	0.34	4.7	4.74	0.6	0.29	9.6	3.91
Northern	0.4	0.19	25.7	17.14	0.2	0.09	23.2	14.31
Southern Highlands	0.2	0.17	11.9	11.23	0.3	0.11	11.8	7.84
Southern	0.5	0.19	15.8	9.35	0.4	0.18	23.1	14.16
Southwest	0.2	0.16	9.3	7.37	0.6	0.22	28.6	15.32
Western	0.1	0.08	5.0	4.56	0.6	0.26	16.6	9.14
Tanzania	0.3	0.06	14.5	3.92	0.4	0.06	14.9	3.29

In Tanzania the average Standard 6 pupil was taught by a reading teacher who attended 0.3 in-service courses lasting a total number of 14.5 days and a mathematics teacher who attended 0.4 courses over a total number of 14.9 days over the three-year period preceding the SACMEQ II survey. There was no significant difference nationally between the number of in-service training courses received by reading and mathematics teachers.

There were significant variations among the zones in the number of in-service courses attended by reading teachers. In Central Zone, teachers received no in-service courses (mean

0.0) while in Kagera and Kilimanjaro they attended about one in-service course (means 0.7 and 0.6 respectively) in the 3-year period. On the other hand, there were insignificant variations for mathematics teachers among the zones. In Mwanza Zone mathematics teachers had attended the fewest number of courses (0.1). In contrast, in Kagera zone the mean was 0.7.

There were similar variations in the number of days spent in attending in-service courses by both reading and mathematics teachers in the zones ranging from a high of 41.8 days in Kagera to a low of 0.6 days in Central Zone for reading teachers and a high number of 34.6 days in Kilimanjaro to a low number of 0.5 days in Mwanza for mathematics teachers.

From the results that have been presented, it is clear that variation among the zones in the number of in-service courses and days attended by teachers in both reading and mathematics was disturbingly high. Reading teachers in Kagera received the most in-service training but, in contrast, those from the Central Zone received the least in-service training.

Policy suggestion 4.4(a). The Ministry should formulate a policy that requires teachers to attend a certain minimum number of in-service courses over a given period of time to ensure that every teacher keeps abreast with the changing demands of the curriculum as well as the needs of learners and of society.

Bearing in mind the changes and reforms of curricula in the education system in general and in primary school in particular, which date back to the 1990s', it is highly doubtful that the number of courses and days attended were adequate to sufficiently orient teachers to these changes. The absence of a clearly defined policy and mechanisms which ensured that teachers received in-service training especially at school level could probably provide part of the explanation of the deficiencies noted. The Ward Based Education Management (WABEM) initiative, a Ministry reform strategy which uses the school cluster approach to improve school management and strengthen community participation at grassroots levels is being piloted in six districts since 1999 has the potential to contribute to the alleviation of the noted deficiency if developed nationwide. The Ministry needs to formulate an in-service

training policy and develop sustainable mechanisms for the equitable provision of continuous in-service training within a decentralized framework focusing on more disadvantaged zones.

Policy Suggestion 4.4(b). The Departments of Teacher Primary Education of the Ministry in collaboration with PORALG should accelerate the establishment, consolidation and replication of Education Cluster Centres under WABEM, in addition to District and Zonal Resource Centres in order to broaden teachers' access to opportunities for in-service training. Mentoring, a component of WABEM, should be developed in each cluster to provide regular teacher in-servicing at school level. Backup services should be provided to the Education Cluster Centres by District, Zonal Teacher/ Resource Centres, the Inspectorate and the Teacher Training Colleges when more specialized training is identified.

Did teachers consider that in-service training improved their teaching?

Teachers were asked to describe the effectiveness of in-service courses they received. Their possible responses were 'no in-service course', 'not effective', 'reasonably effective', 'effective' and 'very effective'. The variables were recoded to produce two categories of responses, namely, 'not effective' and 'effective'. The analyses of their responses as "effective reading and mathematics in-service courses" have been summarized in Table 4.6.

Table 4.6. Percentages and sampling errors for the teachers' perception of effectiveness of reading and mathematics in-service courses

Zone	Effectiveness of the in-service courses			
	Reading in-service courses		Mathematics in-service courses	
	%	SE	%	SE
Central	4.2	4.16	19.5	10.63
Eastern	23.0	8.48	20.0	8.75
Kagera	30.6	12.16	12.9	8.83
Kilimanjaro	31.5	12.37	25.2	11.53
Mwanza	18.1	10.45	12.2	8.71
Northeast	0.0	0.00	26.1	12.08
Northern	21.6	10.64	13.0	7.36
Southern Highlands	8.1	5.13	23.6	10.87
Southern	47.0	19.01	28.2	15.95
Southwest	10.3	8.19	36.6	14.23
Western	13.2	7.55	26.6	9.50
Tanzania	17.1	2.93	21.8	3.30

It can be seen from Table 4.6 that the national averages for teachers responding that in-service courses were effective was 17.1 percent for reading teachers and 21.8 percent for mathematics teachers. This implies that, roughly only about 1 out of every 5 teachers in either reading or mathematics felt that in-service courses were effective.

Very surprising results were noted in Northeast Zone, where none of the reading teachers felt that in-service courses were effective. Other zones with low percentages of teachers who felt that the in-service courses were effective were Central Zone (4.2%) and Southern Highlands (8.1%). The highest percentage of reading teachers responding that in-service courses were effective were in Southern (47.0 %), Kilimanjaro (31.5%) and Kagera (30.6%) Zones.

Variations existed among the zones in the percentage of mathematics teachers responding that in-service courses were effective. Mwanza zone had a particularly low average of 12.2

percent. Other zones with low averages were Kagera (12.9 %) and Northern (13.0%). In contrast, South West Zone had a particularly high average of 36.6 percent.

In general, the results reflect a very negative picture where around 4 out of 5 Standard 6 pupils were taught by teachers who indicated that in-service courses were not effective. Many reasons could be advanced as probable explanations for this situation. Perhaps teachers were not adequately involved in identifying the content of the in-service programs that meet their needs. Alternatively, the methodologies used could have been inappropriate and therefore ineffective, or the knowledge level of trainers could possibly have been inadequate. The figures reflected a serious challenge that required the immediate attention of designers and facilitators of in-service courses: the inspectors, curriculum developers, teacher trainers, and resource centre facilitators. It may be useful to involve teachers in identifying the content of the service programs so that they meet teachers' needs and are relevant to contemporary developments in the education sector. In addition, the methodologies used in the delivery of in-service training of teachers should be examined with a view to making them more user friendly.

Policy suggestion 4.5. The Ministry should investigate why in-service courses in reading and mathematics were regarded as being ineffective by the majority of teachers and use the findings to review the entire in-service programme for teachers with a special focus on enhancing user friendliness and relevance. Special attention should be given to in-service courses in reading in North East Zone and the other zones where the courses were largely not found to be effective.

General Policy Concern 8:

How did Standard 6 teachers allocate their time among responsibilities concerned with teaching, preparing lessons, and marking?

Time spent on lesson preparation

The school curriculum is designed to be implemented within a specific period of time. Therefore it is important that time is managed for each task of the curriculum so that every effort contributes to its effective implementation. A successful lesson begins with careful preparation, which is a function of time, and is associated with the number of lesson periods per day that the teacher teaches. As stated earlier, a primary school pupil in Standards 3-7

should spend four hours of lesson periods per day or 20 hours of lesson periods per week. When a reasonable amount of time is spent on lesson preparation, it can impact positively on teaching. The informed teacher can, for instance, formulate with clarity the teaching objectives, carefully organize the course material into sequential learning tasks, and design relevant questions or tasks to assess pupils' mastery of the skills taught.

How many hours per week did teachers spend in lesson preparation and marking?

The Standard 6 teachers were asked to indicate the time spent on lesson preparation per week and the results have been presented in Table 4.7.

Table 4.7. Means and sampling errors for the teacher time spent on lesson preparation

Zone	Time spent on lesson preparation			
	Reading lesson (hours)		Mathematics lesson (hours)	
	Mean	SE	Mean	SE
Central	20.7	4.05	19.8	3.78
Eastern	22.5	2.93	22.0	2.67
Kagera	19.4	4.22	16.4	2.85
Kilimanjaro	20.6	3.65	22.4	4.84
Mwanza	19.8	2.89	16.4	3.82
Northeast	12.9	2.82	11.0	2.28
Northern	20.0	3.45	20.7	3.25
Southern Highlands	22.5	2.83	17.5	2.95
Southern	15.6	3.91	21.5	5.23
Southwest	12.9	1.49	17.8	3.15
Western	16.8	3.22	20.9	3.08
Tanzania	19.0	1.04	18.9	1.06

The national mean for time spent preparing for lessons was 19.0 hours for reading lessons and 18.9 hours for mathematics lessons. Thus, an average Standard 6 pupil was taught by a reading teacher who spent 19.0 hours on lesson preparation per week and a mathematics teacher who spent 18.9 hours on lesson preparation. There was an insignificant difference in

the time spent on lesson preparation per week between the two subjects. However, slight variations were noted among the zones in both subjects. Eastern and Southern Highlands Zones had the highest means of 22.5 hours each spent on lesson preparation in reading per week while Southwest and Northeast had the lowest mean of 12.9 hours each spent on lesson preparation. In mathematics Kilimanjaro had the highest mean of 22.4 hours spent on lesson preparation per week while Northeast Zone had the lowest mean of 11.0 hours per week spent on lesson preparation.

How many periods did teachers teach and how long were these periods?

Teachers were asked to state how many periods they taught and how long these periods were, and their responses have been summarized in Table 4.8.

Table 4.8. Means and sampling errors for the periods and time spent on teaching per week

Zone	Reading teacher				Mathematics teacher			
	Periods per week		Hours per week		Periods per week		Hours per week	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Central	24.2	2.13	16.1	1.42	28.1	3.53	18.7	2.36
Eastern	16.8	1.87	11.2	1.21	19.0	2.07	12.5	1.21
Kagera	20.6	2.43	13.7	1.55	23.5	2.46	15.7	1.52
Kilimanjaro	26.0	2.39	17.3	1.59	24.4	2.10	16.3	1.40
Mwanza	27.5	3.15	18.3	1.91	26.6	2.57	17.7	1.71
Northeast	18.8	2.66	12.6	1.77	20.8	2.72	14.6	1.71
Northern	27.4	2.57	18.3	1.72	24.5	2.57	16.5	1.44
Southern Highlands	29.8	2.47	20.0	1.57	28.7	2.48	19.1	1.65
Southern	27.1	3.08	18.1	2.05	26.4	2.40	17.6	1.60
Southwest	25.3	2.55	16.9	1.70	27.1	2.51	18.1	1.67
Western	29.4	3.33	19.4	2.05	29.7	3.19	20.3	2.31
Tanzania	25.4	0.85	16.9	0.56	25.7	0.84	17.2	0.54

Nationally, Standard 6 reading teachers taught, on average, 25.4 periods per week that translated to 16.9 hours per week while Standard 6 mathematics teachers taught 25.7 periods (17.2 hours per week). In both subjects the figures fell short of the Ministry norm of 28 teaching periods per week (equivalent to 18.7 hours per week).

Teachers in Eastern Zone and Northeast Zone had much lower workloads in both subjects. In Eastern Zone, on average, the Standard 6 reading teacher taught 16.8 periods whereas the mathematics teacher taught 19 periods per week. In Northeast Zone, the reading teacher taught 18.8 periods per week and mathematics teachers taught 20.8 periods per week, which might imply that there was over deployment of teachers in these zones. The most probable explanation for the few teaching periods of teachers in Eastern Zone could be the over-deployment of teachers, the majority of whom are females who, as has been explained earlier on, followed their husbands. No concrete explanations could be provided for the other extreme cases.

The results showed that, generally, teachers' workloads were slightly below the Ministry norm of 28 periods. It was beyond the scope of this study to establish whether the time spent on lesson preparation and actual teaching would guarantee effective instruction. Thus it would be desirable to investigate whether time spent on lesson preparation resulted in well managed classroom instruction.

General Policy Concern 9:

What were Standard 6 teachers' viewpoints on (a) pupil activities within the classroom (for example, reading aloud, pronouncing, etc.), (b) teaching goals (for example, making learning enjoyable, word attack class teaching, etc.), (c) assessment procedures, and (d) meeting and communicating with parents?

Educational Processes

While physical inputs (such as classrooms, textbooks, exercise books, libraries, etc) and human inputs (teachers with the desired attributes) are a necessary condition for effective learning, on their own they do not ensure high learning achievement. Over and above these, it is the nature of the interaction between pupils and these physical and human inputs that also

contribute to learning. It was considered important, therefore, to examine the processes that take place in the different learning contexts or situations.

Educational processes that were investigated included pedagogical goals, teachers' their views about how they perceived the importance of each of selected activities of teaching reading, and others. The results have been presented in Table 4.9(a).

What did teachers consider to be the most important pupil activities for teaching reading and mathematics?

Table 4.9(a). Percentages and sampling errors for the activities of teaching reading

Activity	Activity rated as 'most important'	
	%	SE
Listening to reading	1.6	0.73
Silent reading	2.5	1.07
Learning new vocabulary	34.4	4.05
Sounding words	12.6	2.87
Reading for comprehension	27.8	3.48
Taking books home to read	7.9	2.07
Reading materials in home	1.4	1.41
Reading aloud in class	11.7	2.35

It is noted from Table 4.9 that Standard 6 pupils attended schools where teaching was predominantly emphasizing learning new vocabulary. This activity was rated highest by 34.4 percent of Standard 6 reading teachers. Other activities rated highly were reading for comprehension (27.8 %) sounding words (12.6%) and reading aloud in class (11.7%) Reading materials at home was rated as least important (1.4%), implying that for teachers regarded the role of the home in promoting reading as very minor or even negligible. The large variations in teachers' perception in each of the eight activities appeared to indicate which areas in the teaching of reading were emphasised more. It is necessary for teaching practices to employ all these activities in order to enhance learning in a more holistic way. Inspectors should establish the activities most frequently employed by teachers and, with the assistance of curriculum specialists, find out whether these contributed the most to learning.

It is possible that some of the more effective activities are shunned by teachers simply because they were more demanding in terms of effort at the planning or execution stages.

Table 4.9(b). Percentages and sampling errors for the activities of teaching mathematics

Activity	Activity rated as ‘most important’	
	%	SE
Working in pairs or groups	23.5	3.36
Working alone	8.8	2.36
Preparing projects to be shown to the class	1.1	0.71
Using practical equipment	14.4	2.96
Homework assignments	1.0	0.68
Studying and interpreting graphs	0.7	0.53
Reciting tables, formule, etc.	5.4	1.74
Quizzes, tests, examinations, etc.	45.0	4.07

It can be seen from Table 4.9 (b) that 45.0 percent of Standard 6 pupils were taught by teachers who rated ‘quizzes, tests, examinations etc’ as the most important activities. Other activities rated highly were ‘working in pairs or groups’ (23.5%) and ‘using practical equipment’ (14.4%). Interestingly, ‘studying and interpreting graphs’ was considered the least important (0.7%). Other activities that received a low rating were: ‘homework assignments’ (1.0%), ‘preparing projects to be shown to the class’ (1.1%), and ‘reciting tables and formulae’ (5.4%). These results indicated that teachers did not attach importance to graphs and homework assignments which would therefore cast some doubt on the quality of homework given to pupils. This could also be interpreted to mean that the teaching of mathematics was more of a drill, presumably for passing examinations and not for enhancing mastery of essential competencies and skills.

What did teachers consider to be the most important teaching goals in reading and mathematics?

The behaviour of teachers as well as the emphasis they placed on the different elements of the curriculum were partly a reflection of the goals they considered to be important. Teachers were therefore asked to rate a set of goals of teaching reading and mathematics. In Table 4.10

(a) and Table 4.10 (b) the results of eight goals rated as most important by reading and mathematics teachers have been separately presented.

Table 4.10(a). Percentages and sampling errors for the goals of teaching reading

Goal	Goal rated as ‘most important’	
	%	SE
Making reading enjoyable	1.4	0.92
Extending vocabulary	3.4	1.37
Improving word attack skills	4.2	1.77
Improving reading comprehension	39.7	4.00
Developing a lasting interest	25.1	3.82
Opening up career opportunities	2.3	0.99
Developing of life skills	23.8	3.25

Table 4.10(b). Percentages and sampling errors for the goals of teaching mathematics

Goal	Goal rated as ‘most important’	
	%	SE
Basic numeracy skills	12.5	2.80
Problem solving	35.8	3.80
Different ways of thinking	31.1	3.43
Confidence in solving problems	1.7	0.93
Satisfaction from doing Mathematics	0.8	0.56
Opening up career opportunities	2.5	1.10
Developing of life skills	15.5	2.85

‘Improving reading comprehension’ was rated as most important goal in teaching reading (39.7%). In mathematics the most important teaching goal was ‘problem solving’ (35.8%). The goals considered to be the least important goals were ‘making reading enjoyable’ in reading and ‘satisfaction from doing mathematics’ in mathematics.

What teaching approaches/strategies were used most frequently by reading and mathematics teachers?

Teachers were asked to indicate how often they used each of the six selected approaches for teaching reading and ten approaches for teaching mathematics. The results of teachers' responses who rated the approaches as being 'often used' have been presented separately in Tables 4.11(a) and Table 4.11(b).

Table 4.11(a). Percentages and sampling errors for the strategies of teaching reading

Approach	Percentage indicating 'often used'	
	%	SE
Introducing passage before reading	85.3	2.79
Asking questions to test comprehension	95.5	1.60
Asking questions to deepen understanding	97.9	1.04
Using materials made by teacher	34.3	3.77
Reading aloud to the class	78.6	3.85
Giving positive feedback	80.4	3.19

Table 4.11(b). Percentages and sampling errors for the strategies of teaching mathematics

Approach	Percentage indicating 'often used'	
	%	SE
Using everyday problems	60.5	3.68
Teaching the whole class as a group	81.1	3.03
Teaching in a small group	24.1	3.39
Teaching individually	22.6	3.46
Teaching through question and answer technique	63.8	3.78
Giving positive feedback	63.6	3.83
Relating to everyday life situations	64.7	3.95
Basic skills training	72.1	3.53
Explaining mathematical processes	86.7	2.55
Using available local materials	78.2	3.27

In Table 4.11 (a) it can be seen that the strategy of ‘asking questions to deepen understanding’ was most often used (average 97.9%). The other strategy most often used was ‘asking questions to test comprehension’ (average 95.5%). The least used strategy was ‘using materials made by teacher’ (average 34.3%). It was clear that Standard 6 pupils were taught by teachers whose main strategies in teaching reading were predominantly deepening understanding and for comprehension. It would be interesting to investigate why teachers did not often use materials they prepared themselves as a strategy for teaching reading.

On the other hand, in mathematics ‘explaining mathematical processes’ was the strategy used most often (86.7%). The other strategy used most often was ‘teaching the whole class as a group’ (81.1%) which could be partly explained by the fact that it is the most handy strategy for teachers to apply, especially in school systems with large size classes as is the case in urban areas. The least used approaches were ‘teaching individually’ (22.6%) and ‘teaching in a small group’ (24.1%). The results are not unexpected but unfortunate, and reflected weaknesses in terms of pupil-teacher interaction and cooperative learning among pupils. Thus the average Standard 6 pupil was taught mathematics by a teacher who did not provide adequate learning support to individuals or groups of pupils.

How often did teachers give written tests in reading and mathematics?

Testing pupils helps the teacher to be informed of the extent to which their teaching had succeeded in facilitating the mastery of the skills by pupils, and it also informs the pupils on the extent of their success in mastering skills taught. It holds both the teacher (as facilitator) and the pupil (as learner) accountable for their tasks. Testing should be regular but its frequency should be controlled to provide space for other learning tasks. Teachers were asked to indicate the frequency of giving pupils tests in reading and mathematics. The results of their responses have been presented separately in Tables 4.12 (a) and Table 4.12 (b).

Table 4.12(a). Percentages and sampling errors for the frequency of reading tests

Zone	Frequency of reading tests					
	Less often		2/3 per month		1 + per week	
	%	SE	%	SE	%	SE
Central	13.9	9.41	33.1	12.61	53.0	13.40
Eastern	4.4	4.38	35.1	11.72	60.5	11.74
Kagera	0.0	0.00	21.3	11.27	78.7	11.27
Kilimanjaro	0.0	0.00	12.4	8.52	87.6	8.52
Mwanza	11.8	8.54	41.6	16.74	46.5	15.82
Northeast	0.0	0.00	17.1	10.23	82.9	10.23
Northern	13.2	7.04	26.6	10.14	60.2	10.56
Southern Highlands	2.4	2.48	26.4	10.95	71.2	11.20
Southern	14.0	12.50	19.4	12.84	66.6	16.65
Southwest	16.1	10.93	10.8	7.68	73.1	12.59
Western	10.9	7.77	3.0	3.02	86.1	8.23
Tanzania	7.9	2.06	23.2	3.46	68.9	3.71

From Table 4.12(a) it can be seen that in Tanzania 68.9 percent of Standard 6 pupils were taught by reading teachers who gave them one test per week. A much smaller percentage of Standard 6 pupils taught by reading teachers who gave them 2 to 3 tests per month (23.2%) or less often (7.9%). In the '1 test per week' category, Kilimanjaro had the highest average (87.6%) followed by Western Zone (86.1%) and North East Zone (82.9%). Mwanza Zone had the lowest average (46.5%) followed by Central Zone (53.0%). High figures were noted for the 'less often category' in South West, Central, Southern and Northern Zones (averages 16.1%, 14.0%, 13.9% and 13.2% respectively) which was worrying and deserved particular attention by inspectors.

Table 4.12 (b). Percentages and sampling errors for frequency of mathematics tests)

Zone	Frequency of mathematics tests					
	Less often		2/3 per month		1 + per week	
	%	SE	%	SE	%	SE
Central	0.0	0.00	56.0	13.89	44.0	13.89
Eastern	14.2	7.92	57.4	11.85	28.4	11.45
Kagera	18.3	10.16	47.9	13.50	33.8	12.79
Kilimanjaro	11.8	8.17	49.8	13.75	38.5	13.14
Mwanza	5.0	5.04	42.1	15.30	52.9	15.82
Northeast	21.1	11.55	43.8	14.24	35.1	14.76
Northern	7.8	5.51	61.2	10.85	30.9	10.02
Southern Highlands	6.1	4.42	45.0	10.19	48.9	9.93
Southern	16.1	12.70	36.0	17.65	47.9	18.85
Southwest	33.3	13.50	40.2	14.07	26.6	14.51
Western	34.7	11.49	30.5	10.76	34.8	12.60
Tanzania	14.2	2.56	47.0	3.99	38.8	3.95

In Tanzania 47.0 percent of Standard 6 pupils were taught mathematics by teachers who gave 2/3 tests per month and about 39 percent of them were taught mathematics by teachers who gave 1 or more tests per week, whereas 14.2 percent were in schools where they were tested less often.

There were slight variations in the frequency of testing among the zones for the '2/3 tests per month' and the '1+ test per week' categories. In the category of pupils who were tested 2/3 a month, (that is, the modal frequency) Northern Zone had the highest percentage of 61.2 percent while Western Zone had the lowest percentage of 30.5 percent. Column 5 of the Table shows that Mwanza Zone had significantly high average of testing Standard 6 pupils (52.9%) once per week, whereas South West Zone was significantly lower (26.6%). However caution should be exercised since these figures were associated with very high standard errors.

Some disturbing results were noted in the 'less often category' where more than 30 percent of pupils in Western and Southwest Zones were taught mathematics by teachers who tested them less than 2/3 times per month.

From these results, it can be observed that the majority of Standard 6 pupils tended to be given 2 or 3 mathematics tests per month. Larger percentages of pupils in Central, Southern Highlands, Mwanza, and Northern Zones were given 2 or 3 tests than in the remaining zones.

Considering the results of the two subjects, it is clear that Standard 6 pupils were tested more frequently in reading (2/3 per month and 1 + per week) than in mathematics and that about twice their percentage (14.2%) were tested less often in mathematics than they were in reading (7.9%).

Pupils taught by teachers who tested pupils less often than 2/3 times per month were disadvantaged. On the other hand, the fact that about 40 percent of the pupils in mathematics and 70 percent of them in reading were tested more than once per week (twice or three times per month) raises concern as to whether this was not meant to drill pupils and hence encourage rote learning rather than allowing them to use other learning tasks for mastery learning. It might be necessary for school inspectors and curriculum specialists to determine the appropriate frequency of testing in reading and mathematics, and to take steps to ensure that teachers test pupils with the required regularity and frequency. Those zones where testing was less often than expected deserved special attention.

Policy suggestion 4.6. School inspectors should investigate why teachers in Western and Southwest zones in mathematics and South West, Central, Southern and Northern Zones in reading tested pupils less often.

How often did teachers meet with parents each year?

It is widely acknowledged that where teachers had frequent meetings with parents they established and maintained a relationship that contributed to a higher reading achievement (Postlethwaite and Ross, 1992). On the basis of this empirical evidence a generalization could be made to all activities leading to learning achievement of joint teacher parent monitoring and support of their children in learning in the school and the home environments.

In this study therefore teachers were asked to indicate the frequency with which they met with pupils' parents. The range of the responses were categorized as 'never', 'once a year', 'once a term', and 'once+ a month'. The variable was recoded so that it was possible to calculate the percentage of teachers who responded that they met with parents frequently, that is, either 'once a term', or 'once+ a month. The results have been presented in Table 4.13.

Table 4.13. Percentages and sampling errors for the frequency of teacher meetings with parents frequently.

Zone	Percentages of teacher meetings with parents frequently			
	Reading teacher		Mathematics teacher	
	%	SE	%	SE
Central	79.0	11.14	83.9	8.97
Eastern	70.4	11.24	67.4	11.51
Kagera	87.1	8.83	75.6	11.29
Kilimanjaro	83.7	11.28	93.8	6.17
Mwanza	70.1	13.54	71.0	13.78
Northeast	59.9	14.72	86.1	9.60
Northern	72.3	10.42	69.9	9.32
Southern Highlands	49.7	13.62	47.4	13.41
Southern	98.2	1.85	61.8	17.65
Southwest	79.9	10.67	78.2	10.95
Western	75.2	10.28	89.5	7.31
Tanzania	71.6	3.91	72.6	3.76

In Tanzania more than two thirds of Standard 6 pupils had reading and mathematics teachers who indicated that they met parents frequently (71.6 % and 72.6 % in reading and mathematics respectively).

In reading, the frequency of the teacher meeting parents was particularly low in Southern Highlands and in Northeast Zone (49.7% and 59.9% respectively). On the other hand, the frequency of meeting parents was particularly high in Southern Zone where 98.2 percent of teachers indicated that they met parents frequently.

In mathematics only 47.4 percent of teachers in Southern Highlands indicated that they met parents frequently while the percentage of mathematics teachers who indicated that they met parents frequently in Kilimanjaro Zone was particularly high (93.8%). The results suggest that more efforts should be directed at increasing the frequency of teacher-parent meetings particularly in Northeast Zone for reading teachers and in the Southern Highlands Zone for both reading and mathematics. Teachers and community members or parents need to be sensitized on the benefits of this relationship.

Policy suggestion 4.7(a). The Inspectorate should collaborate with District Education Offices to establish stable teacher-parent liaison systems in all schools. Once established, the Ward Education Coordinators should oversee the effectiveness of the system.

In most cases, teachers are expected to take the initiative and ensure that there is regular teacher-parent liaison, therefore they need to have skills required to fulfil this role effectively. The institutions providing teacher pre-service and in-service training should ensure inclusion of teacher-parent liaison systems in their curricula or training programs.

Policy suggestion 4.7(b). The Agency for Development of Educational Management (ADEM) and Teacher Training Department should include in their management, pre-service and in-service training programs content that enhances teachers' appreciation of the importance of teacher-parent meetings, and that equips them with skills for enhancing parental participation in children's learning.

General Policy Concern 10:

What was the availability of classroom furniture (for example, sitting/writing places, teacher table, teacher chair, and bookshelves) and classroom equipment (for example, chalkboard, dictionary, maps, book corner, and teacher guides) in Standard 6 classrooms?

There is sufficient evidence to show that instructional materials like textbooks, workbooks, loose folders, desks, chalkboards and others are prerequisites for effective learning. (Fuller, 1994). Teachers may be very competent but without these prerequisites their effect on learning can be limited. In this study it was considered important to establish the extent to which these were available.

What percentages of pupils were in classrooms with adequate classroom furniture and equipment (for example, a teacher table, teacher chair, bookshelves, and chalkboard)?

Did teachers have teaching aids (for example, a map, dictionary, geometrical instruments, and teachers' guides)?

A well resourced classroom creates an environment that is conducive to learning. Pupils get easily motivated to learn what they are meant to learn while teachers get encouraged to play well their facilitation role. The analysis of teachers' responses for the availability of items for both mathematics and reading teachers have been presented in Table 4.14.

Table 4.14. Percentages and sampling errors for availability of classroom resources for the teachers

Resource	Availability of classroom resources			
	Reading teacher		Mathematics teacher	
	%	SE	%	SE
A usable writing board	96.9	1.16	93.0	2.38
Chalk	94.9	1.52	92.2	2.49
A wall chart of any kind	57.6	3.94	56.3	4.17
A cupboard	16.3	3.13	15.8	3.06
One or more bookshelves	13.5	2.76	9.6	2.22
A classroom library or book corner	7.0	1.85	3.5	1.18
A teacher Table	34.8	3.92	29.6	3.60
A teacher chair	38.1	4.03	33.6	3.82

It can be seen from the Table 4.14 rows 1 and 2 that more than 90 percent of Standard 6 pupils were in classrooms with a usable writing board and chalk. The resources that were relatively less available were the classroom library or book corner, book shelves and cupboards (averages of 7.0%, 13.2%, and 16.3% respectively). The dearth of such items limited pupils' opportunities to search for knowledge through other avenues and perpetuated heavy reliance on teachers as the source of knowledge. It deprived pupils of an opportunity to develop a culture of reading and research. In addition, because the availability of bookshelves and cupboards was very low, concern is how classroom supplies like books, teaching aids etc. were managed. The possibility that maintenance of classroom supplies

including textbooks was poor is therefore not unforeseen, and, by extension, the absence of an environment for inculcating a culture of good maintenance of resources. On the other hand, only around one third of Standard 6 pupils were taught by teachers in classrooms with teachers' chairs and tables, which is a clear signal that large proportions of Standard 6 pupils had teachers whose classroom environment was not conducive.

The teachers' responses on classroom resources were combined to construct a classroom resource index by adding up the number of classroom items that each teacher reported out of a total of eight items. The mean scores for the indices across the zones and for the nation have been presented in Table 4.15.

Table 4.15 Means and sampling errors for the classroom resources index

Zone	Classroom resources index			
	Reading teacher		Mathematics teacher	
	Mean	SE	Mean	SE
Central	3.3	0.37	3.2	0.43
Eastern	3.6	0.57	3.1	0.35
Kagera	3.5	0.57	3.2	0.38
Kilimanjaro	5.1	0.56	4.4	0.69
Mwanza	2.7	0.33	3.6	0.34
Northeast	4.1	0.64	3.4	0.66
Northern	3.6	0.38	2.6	0.37
Southern Highlands	3.5	0.33	3.4	0.33
Southern	4.3	0.65	3.5	0.50
Southwest	3.6	0.42	3.5	0.44
Western	2.6	0.38	3.3	0.38
Tanzania	3.6	0.14	3.3	0.14

The average classroom resource index for Tanzania was 3.6 for reading teachers and 3.3 for mathematics teachers. There was very little variation among the zones. Kilimanjaro had a significantly high mean of 5.1 and 4.4 in reading and mathematics respectively. In contrast, Western and Mwanza Zones had particularly low mean indices of 2.6 and 2.7 respectively for reading, and Northern Zone had the lowest mean index of 2.6 for mathematics teachers.

The overall picture portrayed by these results reveals a scarcity of classroom resources since Standard 6 pupils were in schools with between 3 and 4 out of 8 items, which is less than half of the expected number of selected items. The picture could be used to guide the Ministry efforts under PEDP to resource schools so that these deficiencies are corrected.

**What percentages of pupils were in classrooms
with adequate sitting and writing places?**

Pupils need to study in comfortable, learner-friendly classroom environments in order to increase their concentration and time-on-task. It is in this regard that the Ministry set a norm requiring that every pupil should have a writing and a sitting place in class. In this study Standard 6 pupils were asked to indicate whether they had a sitting and a writing place. Standard 6 pupils who indicated that they had a sitting and a writing place have been reported in Table 4.16.

Table 4.16. Percentages and sampling errors for pupils having sitting and writing place places.

Zone	% having sitting place		% having writing place	
	%	SE	%	SE
Central	96.2	1.42	97.5	0.99
Eastern	98.3	0.79	95.8	2.36
Kagera	97.2	1.16	97.3	1.16
Kilimanjaro	98.1	1.04	97.8	1.05
Mwanza	99.5	0.35	98.5	0.90
Northeast	94.3	3.76	92.9	4.44
Northern	97.5	1.08	96.5	0.95
Southern Highlands	99.2	0.39	96.6	1.10
Southern	93.8	2.53	90.2	4.28
Southwest	94.8	2.03	93.5	2.22
Western	89.0	4.13	87.9	4.23
Tanzania	96.3	0.64	95.0	0.75

For the nation as a whole, 96.3 percent of Standard 6 pupils had sitting places while 95.0 percent had writing places. The national averages for sitting and writing places were very nearly equal which would be expected since for most of the schools pupils would use a desk (a combination of a sitting and a writing place). In addition, the results reflected the success of the government appeal of the mid-1990s which encouraged local authorities and communities to supply schools with desks. However, in spite of this success, the massive intake rates into primary education since year 2002 will most probably have changed the picture a great deal. There were very small variations among the zones which ranged from highs of 99.5 percent and 98.5 percent in Mwanza Zone to lows of 89.0 percent and 87.9 percent in Western Zone for sitting and writing places respectively. The Ministry should be concerned to note that whereas more than 90 percent of Standard 6 pupils had sitting and writing places, only around 30 percent of them had teachers with a teacher's chair and a teacher's table. In this regard, the classroom environment was reasonably pupil friendly but very teacher unfriendly, yet the pupil and the teacher were so interdependent in the teaching-learning process. This deserves Ministry's attention in future supply of furniture to primary schools.

General Policy Concern 11:

What professional support (in terms of education resource centres, inspections, advisory visits, and school head inputs) was given to Standard 6 teachers?

As stated earlier, teachers need to be continuously supported in order that they are kept abreast of the developments in education and are effective in imparting to learners relevant knowledge and skills that meets the needs of individuals and those of the society. School inspectors, academic advisors, ward education coordinators, education cluster/teacher resource centre facilitators, and head teachers play an important role in this regard. The interaction of teachers with these professionals and their visits to education cluster/teacher resource centres to use available resources impact positively on their professional development and inculcates a spirit of confidence in their work.

Did teachers use education resource centres?

Teachers were asked to indicate how they used the resource centres. The responses included “no education resource centre”, “not visited” and “visited”. The results of their responses have been presented in Table 4.17.

Table 4.17. Percentages and sampling errors for the availability of education resource centres for teachers.

Zone	Reading teacher						Mathematics teacher					
	None available		Have not visited		Have used		None available		Have not visited		Have used	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Central	38.4	12.95	16.8	9.53	44.8	12.88	8.0	8.02	19.1	10.53	72.9	12.21
Eastern	24.1	9.62	28.5	8.85	47.3	10.75	33.4	9.95	27.1	11.28	39.5	9.83
Kagera	79.5	10.97	7.3	7.35	13.2	9.02	71.6	12.37	7.1	7.08	21.3	11.27
Kilimanjaro	21.8	11.90	6.2	6.17	72.0	12.63	27.6	12.54	6.2	6.17	66.2	13.09
Mwanza	58.2	15.16	0.0	0.00	41.8	15.16	49.4	16.19	8.1	6.05	42.5	15.28
Northeast	61.6	13.87	16.6	9.81	21.8	11.84	75.0	12.13	9.6	7.35	15.3	10.52
Northern	74.8	10.91	3.8	3.81	21.4	10.59	87.6	7.04	0.0	0.00	12.4	7.04
Southern Highlands	22.5	8.72	15.0	8.34	62.4	12.09	24.0	9.13	13.9	7.44	62.1	9.15
Southern	50.5	18.79	0.0	0.00	49.5	18.79	50.5	18.79	21.4	19.46	28.1	14.98
Southwest	50.1	14.86	5.9	5.93	44.0	15.08	39.6	14.18	0.0	0.00	60.4	14.18
Western	75.1	9.44	5.5	5.58	19.4	8.58	69.2	12.71	0.0	0.00	30.8	12.71
Tanzania	49.1	3.90	10.3	2.24	40.5	4.00	49.5	3.79	10.1	2.43	40.4	3.61

In Tanzania, the average percentage of reading teachers who indicated that they used the centres was 40.5 percent. The corresponding figure for mathematics teachers was 40.4 percent. On the other hand, 49.1 percent and 49.5 percent of reading and mathematics teachers respectively responded that they did not have a resource centre and just over 10 percent of either reading or mathematics teachers responded that they had not visited the centre.

There were significant variations across the zones in the percentages of teachers who responded that they had used the centre in both subjects. Kilimanjaro Zone had the highest percentage of reading teachers using the resource centre (72%) whereas Kagera had the lowest percentage of Reading teachers (13.2%) using the resources centre.

Kagera Zone had the highest percentage (79.5%) of reading teachers having no resource centre, which explains the low percentage of teachers who used the centre in the zone. Northern and Western Zones had also very high percentages of teachers with no resource centres (74.8 % and 75.2 % respectively). In mathematics, Central Zone had the largest percentage of teachers using the resource centre (72.9%) while Northern Zone had the lowest percentage of 12.4 percent. Eastern and Southern Zone respectively had the largest percentage of teachers who had not visited the centres (27.1% and 21.4%).

It can be concluded that less than half of Standard 6 teachers used the resource centres. Furthermore, the facility was inequitably distributed across the zones, leaving teachers in Northern, Western and Kagera Zones very much disadvantaged with regard to the provision of this facility.

How did teachers use education resource centres?

Education resource centres provide an opportunity for teachers to share experiences among themselves. The centres can also provide an opportunity for both teachers and pupils to make further reference and share resources that cannot easily be made available to individual schools, teachers, pupils and the general community. Teachers can also exercise their innovative abilities through, for instance, preparing teaching/learning materials and aids using facilities and services provided by the resource centre. The question is whether teachers used the resource centres for these purposes. Teachers were asked to indicate how they used the resource centres. The results of the analyses of their responses have been presented separately in Table 4.18 (a) and Table 4.18 (b).

Table 4.18(a). Percentages and sampling errors of reading teacher's purposes for using the resource centre

Zone	Reading teacher									
	Don't use		Borrow material		Make material		Training		Speak with teachers/staff	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	27.2	15.03	31.2	11.97	25.1	11.27	24.4	11.02	44.8	12.88
Eastern	37.6	11.28	35.2	9.96	27.5	7.95	36.4	10.22	43.0	11.16
Kagera	35.8	41.73	7.0	7.04	0.0	0.00	7.0	7.04	7.0	7.04
Kilimanjaro	7.9	7.97	40.3	13.54	50.2	13.75	65.5	13.21	59.1	13.56
Mwanza	0.0	0.00	41.8	15.16	23.2	12.14	11.4	8.24	36.8	14.56
Northeast	43.1	24.54	15.8	10.75	6.0	6.09	15.8	10.75	21.8	11.84
Northern	15.1	17.55	21.4	10.59	17.9	10.29	16.8	10.02	21.4	10.59
Southern Highlands	19.4	11.28	55.2	13.07	49.2	13.90	40.5	14.47	62.4	12.09
Southern	0.0	0.00	37.5	19.67	27.7	19.28	43.3	19.16	40.1	19.43
Southwest	11.8	12.76	36.2	15.08	29.9	14.98	36.2	15.08	44.0	15.08
Western	22.3	24.28	10.0	7.00	10.0	7.00	19.4	8.58	19.4	8.58
Tanzania	20.3	4.33	31.8	4.06	26.0	3.88	29.0	3.86	37.9	4.04

Table 4.18(b). Percentages and sampling errors of mathematics teachers' purposes for using the resource centre

Zone	Mathematics teacher									
	<i>Don't use</i>		Borrow material		Make material		Training		Speak with teachers/staff	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	20.8	11.39	38.0	14.10	26.7	12.14	49.6	13.94	72.9	12.21
Eastern	40.7	14.67	15.4	8.36	7.0	4.67	31.0	8.96	32.3	9.51
Kagera	24.9	27.84	21.3	11.27	14.3	9.68	14.0	9.48	14.0	9.48
Kilimanjaro	8.5	8.64	46.5	13.71	66.2	13.09	56.1	13.86	46.7	13.72
Mwanza	16.1	11.95	29.3	13.30	26.7	13.01	24.1	11.90	33.3	14.12
Northeast	38.6	33.61	15.3	10.52	8.4	8.46	15.3	10.52	15.3	10.52
Northern	0.0	0.00	8.8	6.19	7.0	5.13	2.4	2.40	12.4	7.04
Southern Highlands	18.3	9.45	23.7	9.92	15.6	8.39	31.3	11.87	54.0	9.87
Southern	43.3	39.11	5.7	5.90	5.7	5.90	21.9	13.78	20.5	13.66
Southwest	0.0	0.00	19.9	11.85	17.3	11.70	52.7	14.75	33.5	13.81
Western	0.0	0.00	19.7	12.06	19.2	11.96	26.2	9.98	30.8	12.71
Tanzania	20.0	4.49	21.1	3.22	17.9	2.87	27.5	3.34	33.9	3.61

The results presented in Tables 4.18(a) and 4.18(b) show that the most common purpose for using the resource centre was 'speaking with other teachers' for both reading teachers (37.9%) and mathematics teachers (33.9%). Standard 6 pupils were taught by reading and mathematics teachers who stated also that they used the centres for borrowing materials (31.8%) and training (29.0%). Apart from speaking with other teachers, more reading teachers used the resource centre for borrowing materials (31.8%) than for training (29.0%). This order was reversed for mathematics teachers where more mathematics teachers used the centres for training (27.5%) than for borrowing materials (21.1%). The least common use of the resource centre for both reading and mathematics was 'making material'. Interestingly, there were slightly higher percentages of reading teachers indicating that they used the resource centre for each of the listed uses.

Significant variations were noted across the zones in the use of the resource centres but the zonal figures tended to be associated with high standard errors of sampling.

Overall, the results show that Standard 6 pupils were taught by reading and mathematics teachers who used the resource centres for speaking with other teachers, training, borrowing material and making material. Reading teachers used the resource centres slightly more extensively than their mathematics counterparts. The figure for making material was very low, especially since this area enhanced the capacity of the teacher to be innovative and make material that are tailored to his/her classroom situation and for active learning. Resource centre facilitators will need to focus their attention to a more balanced activity schedule that encourages important activities when planning for future activities of the resource centre.

Policy suggestion 4.8(a). The Ministry's Departments of Primary Education and the Inspectorate in collaboration with TIE and PORALG should build resource centres' capacity for planning future activities that encouraged teachers' innovative skills like making teaching/learning material in addition to other important activities carried out at the centres

The Ministry efforts to rework the resource centre system to support teaching/learning is commendable. The establishment of district Teachers' Resource Centres (TRCs), some of which were under DBSPE, and the grassroots Education Cluster Centres (E.C.C.) under Ward Based Education Management (WABEM) strategy are some of the Ministry initiatives which nevertheless need to be consolidated for replication on a national scale as a matter of urgency in order to address the disparities of the facility which were noted among the zones.

Policy suggestion 4.8(b). The Department of Primary Education in collaboration with PORALG should collectively implement and consolidate the WARD based management initiative in six districts where this is being piloted, preferably within one year, and replicate this nation wide thereafter.

Policy suggestion 4.8(c). The Department of Teacher Education and TIE, in collaboration with PORALG should ensure the establishment of district and zonal teacher resource centres across the districts and zones in order to back up the grassroots education cluster centres under WABEM.

What support did Advisors or Inspectors give to teachers in terms of administrative, professional, and pedagogical matters?

School Inspectors and District Academic Officers give advice to teachers on administrative, professional, and pedagogical matters. Others who provide such advice are Ward Education Coordinators, Education Cluster/Teacher Resource Centre Facilitators, and head teachers. However Inspectors are mandated to inspect schools as their other primary role in addition to advising teachers.

Teachers were asked to indicate whether they agreed or disagreed with selected 12 actions of inspectors and advisors in order to assess the extent of support they received from the latter two. The actions were clustered under 3 areas namely: 'pedagogical', 'critical versus advisory role' and 'professional development role'. The results of their responses have been summarized in Table 4.19.

Table 4.19. Teachers' descriptions of the actions of the inspector and advisor.

Description of the actions	Percentage of teachers agreeing							
	Reading teacher				Mathematics teacher			
	Inspector		Advisor		Inspector		Advisor	
	%	SE	%	SE	%	SE	%	SE
<i>Pedagogical role</i>								
Bring new ideas	91.3	2.51	84.8	2.98	95.4	1.46	86.6	2.60
Clarify educational objectives	91.9	2.44	83.2	3.17	89.5	2.57	80.7	3.35
Recommend new teaching materials	87.1	2.86	81.2	3.26	85.1	2.95	76.6	3.48
Contribution to my classroom teaching	28.2	3.73	29.7	3.87	33.3	3.73	38.7	4.12
Explain curriculum content	90.2	2.37	79.3	3.44	89.2	2.45	79.9	3.27
Suggest improving teaching methods	92.8	2.28	85.4	3.10	92.9	2.28	84.9	3.15
<i>Critical versus advisory role</i>								
Comes to advise	96.4	1.73	89.0	2.67	98.1	0.97	86.7	2.65
Comes to criticise	85.0	3.08	70.0	3.76	83.5	3.03	70.4	3.90
Finds faults and report them to the employer	38.5	3.91	34.5	3.85	44.1	3.83	27.5	3.75
<i>Professional development role</i>								
Provides information for teacher self-development	65.8	3.88	72.1	4.19	64.0	3.98	77.5	3.42
Encourage professional contacts with other teachers	88.2	2.60	83.6	3.17	87.3	2.75	80.3	3.34
Provides in-service training to teachers	44.9	4.07	36.6	4.07	48.0	3.92	34.8	4.12

Under 'pedagogical role' teachers were in agreement with both inspectors and advisers' pedagogical actions. Reading and mathematics teachers ranked highest 'bringing new ideas' and 'suggest improving teaching methods' for both inspectors and advisors. The rating for inspectors under 'bringing new ideas' was 91.3 percent and 94.5 % by reading and mathematics teachers respectively and it was 84.8 percent and 86.6 percent for advisers.

Under ‘critical versus advisory role’, both reading and mathematics teachers rated highest the action ‘come to advice’ for both inspector and advisor. The average rating by reading teachers was 96.4 percent and 89.0 percent for inspectors and advisors respectively, and 98.1 percent and 86.7 percent for inspectors and advisors respectively by mathematics teachers. A special feature in this cluster was the high figure of around 70 percent for advisors and above 80 percent for inspectors indicating that advisors and inspectors came to criticise the work of teachers where inspectors rating was significantly higher than that for advisors.

Under ‘professional development role’ teachers’ rated highest the action ‘encourage professional contacts with other teachers’ for both inspectors and advisors. Rating by reading teachers’ was 88.2 percent and 83.6 percent for inspectors and advisors respectively. The rating by mathematics teachers was 87.3 percent and 80.3 percent for inspectors and advisors respectively. Teachers were not very satisfied with the following actions: ‘provide in service training to teachers’ and ‘provide information for teacher self development’.

The lowest rated actions for both inspectors and advisors were: ‘finds fault and report them to the employer’ (from 27.5% to 44.1 %) and ‘contribution to my classroom teaching’ (from 28.2% to 38.7 %). Again, these were expected since presumably the functions of inspectors and advisers discouraged the former action and did not emphasize the latter. Nevertheless, it is worth noting that inspectors were rated higher than advisers by both reading and mathematics teachers under variables: ‘finds fault and reporting them to employer’ and ‘comes to criticize’.

The trend that seemed to emerge was that in each of the 3 clusters of actions, inspectors tended to be rated higher than advisors which would be expected since, unlike advisors, inspectors are well trained in their inspectoral and advisory functions. Differences in rating inspectors and advisors for the various actions listed were noted but they were not significant for many.

It can be concluded from the results that teachers tended to agree more with the pedagogical role of advisors and inspectors than with the critical versus advisory and professional development roles. Big similarities of the perceived actions between inspectors and advisors

were noted which seemed to suggest that there was a measure of duplication in the work of the two cadres who, however, work independently. The Ministry may wish to investigate the roles and functions of advisers and inspectors to make best use of the potential of each cadre. In addition there is need to in-service both cadres in order to prepare them for a more professional discharge of their advisory functions.

Did school heads advise teachers on their teaching?

The head teacher is the first and most regular teacher advisor in any school system. He oversees the realization of school vision and mission, and is at the heart of the functioning of the school administration. Teachers were asked to rate the frequency of advice they got from their school head teachers. The ratings ranged from 'never', 'once a year,' 'once a term', 'once+ a month' and 'I am the head teacher' (in the case where the subject teacher was also the head teacher). The variable was recoded so that it was possible to figure out the percentage of teachers receiving advice either 'once a year,' 'once a term', or 'once+ a month'. Their responses were analysed and the results reflected in Table 4.20.

Table 4.20. Percentages and sampling errors for the frequency of advice to teacher from school head

Zone	Percentage of teachers receiving advice 'sometimes' or 'often'			
	Reading teacher		Mathematics teacher	
	%	SE	%	SE
Central	100.0	0.00	81.0	13.06
Eastern	96.2	3.86	94.8	3.43
Kagera	85.1	10.15	100.0	0.00
Kilimanjaro	100.0	0.00	100.0	0.00
Mwanza	100.0	0.00	88.0	12.34
Northeast	92.5	6.74	93.6	6.51
Northern	90.3	6.76	84.0	9.06
Southern Highlands	100.0	0.00	96.1	3.99
Southern	100.0	0.00	100.0	0.00
Southwest	93.1	6.93	92.0	8.19
Western	86.6	9.46	93.6	6.53
Tanzania	95.4	1.56	92.7	2.15

Nationally, slightly higher percentages of reading teachers said that they sometimes got advice from their school head teachers than their mathematics counterparts (95.4 % against 92.7 % respectively). All Standard 6 reading teachers (100 %) in five zones and all mathematics teachers (100 percent) in three zones responded that they sometimes got advice from their school head teacher. Kagera Zone and Western Zone had lowest averages of 85.1 percent and 86.6 percent respectively in Reading. In mathematics, Central and Northern Zones had the lowest averages of 81.0 percent and 84.0 percent respectively. However, the variations among the zones were not significant.

It can be concluded from the results that, generally, Standard 6 pupils were taught by teachers who got advice from their head teachers.

General Policy Concern 12:

What factors had most impact upon teacher job satisfaction?

Sources of Teacher Satisfaction

It is agreed widely that teachers' satisfaction is among the critical pointers of their hard work and the extent of their commitment to see their children learn effectively. Satisfied teachers like their work and are less likely to quit the job.

Possible reasons for their job satisfaction

Teachers responded to 16 possible reasons that had most impact upon their job satisfaction. The reasons covered the following broad areas: 'living conditions', 'school facilities/equipment', 'relationship with others' 'career advancement' and 'educational outcomes of pupils'. The analysis of their responses has been summarized in Table 4.21.

Table 4.21. Percentages and sampling errors for teacher ratings of reasons for job satisfaction being the 'most important'

Reason given	Reading teacher		Mathematics teacher	
	%	SE	%	SE
Travel distance to school	4.7	1.43	6.0	1.96
Location of school	2.1	1.06	2.0	1.16
Quality of the school buildings	5.6	1.77	8.8	2.33
Availability of teacher housing	6.6	2.05	3.7	1.55
Quality of teacher housing	5.1	1.77	3.3	1.48
Availability of classroom furniture	4.8	1.52	3.4	1.21
Quality of classroom furniture	0.0	0.00	0.7	0.67
Level of teacher salary	32.2	3.69	32.6	3.74
Timely payment of salaries	5.4	2.05	9.3	2.31
Seeing pupils learn	6.8	1.85	3.8	1.38
Availability of classroom supplies	13.5	2.62	12.4	2.74
Quality of school management and administration	4.4	1.56	2.8	1.18
Amicable working relationships	0.7	0.57	0.5	0.50
Good relationships with the community	1.6	1.11	3.0	1.38
Expanded opportunities for promotion	0.0	0.00	0.3	0.27
Opportunities for professional development	6.5	1.90	7.4	1.94

In Tanzania Standard 6 pupils were taught by reading and mathematics teachers who perceived salary as the most important factor for their job satisfaction (32.2% and 32.6% respectively for reading and mathematics). Other factors or reasons which received a high rating were: availability of classroom supplies (13.3%) by reading teachers and 12.4% by mathematics teachers). Reading teachers rated 'seeing pupil learn' and 'opportunities for professional development' as their third and fourth most important reason for their job satisfaction (6.8% and 6.6% respectively) while the third and fourth choices for mathematics teachers were 'quality of school buildings' (8.8%) and 'opportunities for professional development'.

The least important factors for both reading and mathematics teachers were: 'expanded opportunities for promotion' and 'quality of classroom furniture'.

Altogether, three common factors with the biggest impact on teachers' job satisfaction ranged from 'level of teacher salary', 'availability of classroom supplies' and, 'opportunities for professional development'.

The Ministry's PEDP is addressing most of the highly rated factors. However quality classrooms and teachers' houses that are being built and classroom supplies that are being provided need to be maintained whilst relevant in-service training of teachers needs to be provided to all teachers on regular basis beyond the PEDP period. It is imperative for the Local Authorities to establish in their future plans, mechanisms that will address these factors sustainably through the gains made under PEDP.

Policy suggestion 4.9 PORALG should ensure that local authorities in collaboration with school committees have greater involvement in and establish mechanisms at school level for the maintenance of teachers' houses and other buildings, and ensure an adequate provision of classroom supplies so as to sustain the gains made when PEDP comes to an end in 2006.

In addition, the Government endeavours to review regularly salaries of civil servants, including those of teachers. However, Teachers constitute the largest civil service force that works in the most remote and less developed parts of the country. Clearly given this context the Government may wish to review teachers' salaries and their incentive schemes as far as possible in order to enable them to survive on them alone.

Policy suggestion 4.10 The government, in collaboration with Tanzania Teachers Union (TTU), should review teachers' salary to levels that can enable them to survive on it alone. In addition, the government should design an incentive package that includes introducing hardship allowances to teachers who work in remote areas.

Conclusion

This chapter examined teachers' characteristics and their viewpoints on teaching, classroom resources, professional support, and job satisfaction. An analysis of the results was compared with Ministry norms and benchmarks where these existed. The analysis was clustered into the following seven areas of general concern: personal characteristics, professional characteristics and teachers' viewpoint on in service training, and time allocation of teachers in respect of various pedagogical tasks. Other areas were teachers' viewpoints on pupils' activities in the classroom; teaching goals, teaching approaches, assessment procedures and meeting with parents. The final cluster was on the availability of selected classroom furniture and supplies, professional support teachers received and what they perceived as most impacting to their job satisfaction.

Suggestions were made to the Ministry in collaboration with PORALG to review the teacher deployment policy to bring about a more equitable distribution of teachers by gender and by academic qualification, and to work out a more regular and geographically equitable in-service training program for teachers across the zones in both subjects. Disparities in the gender distribution were alarming in Southern zone. It was also proposed that in-service courses be designed in such a way that they are more teacher friendly (that is, relevant to teachers' needs and contemporary developments).

A suggestion for school inspectors to investigate why teachers in some zones rarely tested pupils in mathematics and in reading was made.

Other suggestions included the consolidation of the education cluster system/resource centres under the Ward Based Education Management initiative (WABEM) in six districts where this was being piloted, preferably within one year, and its replication nation-wide thereafter. Emphasis was put on teacher trainers, curriculum developers and inspectors to redesign their respective programs so as to enhance teachers' skills. In particular, the programs should help

teachers to adopt pedagogical practices that promoted skills mastery among pupils and discouraged teaching merely for examination purposes.

With regards teachers' housing, it was recommended that the Ministry in collaboration with PORALG should address the unacceptable teachers housing conditions through construction of teachers' houses with a focus on the zones that are most least provided with this facility, and, with community contribution where necessary, maintain those that were constructed with PEDP funding, . Furthermore, a proposal was made to the two Ministries to conduct a census of all primary schools in order to establish the extent of demand for teaching materials and classroom furniture. Thereafter, efforts should be made to provide these through the use of PEDP funding, with parental contributions where necessary.

Chapter 5

School Heads' Characteristics and their Viewpoints on Educational Infrastructure, the Organization and Operation of Schools, and Problems with Pupils and Staff

Introduction

In this chapter the school heads' characteristics and their viewpoints on educational infrastructure, the organization and operations of schools and problems with pupils and staff have been presented. The reasons for presenting these data are much the same as those that have already been provided in Chapter 3 and 4 for teacher and pupil data.

The head teacher plays a central role in all facets of the school's operation. He or she, for example, manages the school curriculum, provides instructional leadership, and initiates or strengthening partnerships among members of the school community and between the school community and the local community. In Tanzania the primary school system is decentralized and with the introduction of PEDP, the head teachers have been charged with the extra responsibility of managing funds that are sent directly to schools. Each school has its own school development plan and a bank account. The head teacher, in collaboration with the school committee, is the final authority of school plans and the budgets linked to them. An analysis of their characteristics and viewpoints is therefore important since they are provide internal supervision, mobilise funds and other resources to meet the needs of the staff and pupils, and are the bridge between the school and the local community. It is expected that the results will provide a good picture of the capacity of school heads in the context of the roles they should play within their school contexts. Where appropriate, recommendations have also been made.

General Policy Concern 13:

What were the personal characteristics of school heads (for example, age, and gender)?

Age and gender

Head teacher age and gender are important attributes for various purposes, among them planning their utilisation and allocation among schools and among regions. For example, head teachers tend to be older members of the school staff and of the teaching service as a whole, and therefore plans for their replacement need to be in place as they come to their retirement age or when they die. On the other hand, it is also important to know the degree of gender among head teachers because this reflects the extent to which the school system exploits all the human resource pool available to it and as well as offering equal opportunities to both male and female members of the teaching profession.

What was the age distribution of school heads?

Table 5.1. Means, percentages, and sampling errors for school head age and gender

Zone	Age (years)		Gender (female)	
	Mean	SE	%	SE
Central	42.6	1.98	7.1	7.08
Eastern	46.6	1.19	49.3	13.93
Kagera	44.1	1.87	19.4	10.45
Kilimanjaro	41.8	1.63	39.0	13.91
Mwanza	41.8	2.48	23.5	12.71
Northeast	42.3	1.63	14.5	10.07
Northern	43.9	1.47	15.0	8.59
Southern Highlands	41.6	1.80	0.0	0.00
Southern	40.1	1.49	31.4	20.08
Southwest	37.5	1.54	8.1	8.17
Western	39.4	1.25	14.2	8.08
Tanzania	42.1	0.53	18.4	3.18

Nationally, the mean age of head teachers for Standard 6 pupils was 42.1 years. There were considerable variations of head teachers' ages among the zones. Eastern Zone had the oldest

head teachers where the mean age was 46.6 years. By contrast head teachers in South West Zone were youngest with a mean age of 37.5 years. The figure for Eastern Zone could be partly explained by the fact that teachers posted to the zone are predominantly married females as earlier on established in Chapter 4. Once they are posted they do not easily get transferred because of their marital status. This state leaves little room in the zone for promoting young teachers to head schools.

Generally, head teachers were older and more experienced than their reading and mathematics teachers. It can be observed in Chapter 4 that reading and mathematics teachers were between 37 and 38 years old, which was expected since, under normal circumstances, to become a head teacher one has to have served as a class teacher for some years.

What was the gender distribution of school heads?

It is expected that staffing of primary schools, including appointment of head teachers, should ideally ensure a fair representation of males and females as this generally engenders a balanced and healthy learning environment. Pupils (both girls and boys) get motivated to learn and to have high aspirations when they see role models of their gender among the school staff, including their head teachers.

In Table 5.1 column 4 it can be seen that for Tanzania, 18.4 percent of Standard 6 pupils had females head teachers. There were considerable variations among the zones. Eastern Zone had an average of 49.3 percent of female head teachers. Other zones with high averages of female head teachers were Kilimanjaro and Southern Zone which had averages of 39.0 percent and 31.4 percent of female teachers respectively. Southern Highlands Zone had no female head teacher (average 0.0 %), a situation that should be of serious concern to Ministry and certainly warrants investigation. It is beyond expectation that there were no female head teachers in the zone in which 35.4 percent of all mathematics teachers and 69.2 percent of all Kiswahili teachers were female. Southwest and Central Zones also had low percentages of female head teachers of 8.1 percent and 7.1 percent respectively.

Overall, Standard 6 pupils were in schools headed predominantly by male head teachers, which indicated that the appointment policy of head teachers in Tanzania has so far not been gender sensitive, and needs to be reviewed.

Policy suggestion 5.1(a). The Ministry should review its school head appointment policy in order to ensure gender balance among primary school head teachers.

Policy suggestion 5.2(b). The Inspectorate should investigate why there were no female head teachers in the Southern Highlands Zone and liaise with district education offices to effect corrective measures.

General Policy Concern 14:

What were the professional characteristics of school heads (in terms of academic, professional, experience, and specialized training)?

Effective management of the school curriculum depends very much on academically and professionally qualified head teachers. An analysis of their professional characteristics including academic, professional, experience, and specialized training was made, and the results have been summarized in Tables 5.2 and 5.3.

How many years of academic education had school heads completed? What percentages of the school staff had post-secondary academic education?

Table 5.2. Level of academic education of head teachers

Zone	Level of academic education									
	Primary		Junior secondary		Senior secondary		A-level		Tertiary	
	%	SE	%	SE	%	SE	%	SE	%	SE
Central	19.2	10.40	0.0	0.00	80.8	10.40	0.0	0.00	0.0	0.00
Eastern	0.0	0.00	0.0	0.00	73.3	12.00	26.7	12.00	0.0	0.00
Kagera	0.0	0.00	0.0	0.00	78.5	11.34	21.5	11.34	0.0	0.00
Kilimanjaro	0.0	0.00	0.0	0.00	100.0	0.00	0.0	0.00	0.0	0.00
Mwanza	11.2	8.02	0.0	0.00	79.8	11.57	9.1	9.14	0.0	0.00
Northeast	10.0	8.46	0.0	0.00	83.4	10.34	6.6	6.61	0.0	0.00
Northern	8.4	5.92	0.0	0.00	91.6	5.92	0.0	0.00	0.0	0.00
Southern Highlands	6.9	7.06	0.0	0.00	72.3	12.06	20.8	10.75	0.0	0.00
Southern	11.1	11.32	0.0	0.00	76.8	15.70	12.2	12.40	0.0	0.00
Southwest	15.9	10.81	0.0	0.00	84.1	10.81	0.0	0.00	0.0	0.00
Western	10.9	7.51	9.5	6.63	74.7	10.31	4.9	4.93	0.0	0.00
Tanzania	8.6	2.31	1.0	0.70	81.0	3.32	9.4	2.49	0.0	0.00

From Table 5.2 it can be seen that, nationally, the average Standard 6 pupils had a head teacher with a senior secondary level of academic education (that is, 12 years of academic education). Some 81.0 percent of head teachers indicated that they had attained senior secondary education. A much smaller percentage had attained advanced level education (9.4%) and an even smaller one had only primary education (8.6%). None of the Standard 6 pupils had head teachers who reached tertiary level of education.

Head teachers in Kagera and Eastern Zones had the highest academic qualifications, with more than 20 percent of them having reached A-level (equivalent of 14 years of academic education) and the rest senior secondary education. By contrast, Central Zone had the most lowly qualified head teachers where around 19 percent of them had only reached primary education.

How many years of teaching experience had head teachers completed?

Ordinarily, it is expected that teaching experience is a prerequisite for an effective head teacher. The teaching experience of head teachers, including the number of years they had been head teachers, were analysed and the results have been presented in Table 5.2.

Table 5.3. Means and sampling errors for the teaching experience and training of the school heads

Zone	Experience (years)		Teacher training (years)		Specialised training (weeks)	
	Mean	SE	Mean	SE	Mean	SE
Central	16.3	1.56	2.0	0.10	3.2	0.89
Eastern	22.6	1.02	1.9	0.23	8.8	4.80
Kagera	16.6	2.23	2.2	0.15	3.7	0.90
Kilimanjaro	19.0	1.53	1.7	0.16	3.4	0.89
Mwanza	17.7	2.11	2.2	0.17	2.5	0.70
Northeast	16.8	1.23	1.8	0.17	3.7	0.89
Northern	19.9	1.60	1.8	0.10	4.4	0.82
Southern Highlands	16.6	1.87	2.0	0.05	3.8	0.57
Southern	18.8	2.02	2.0	0.32	2.9	0.97
Southwest	11.5	1.70	2.3	0.18	5.9	4.10
Western	15.4	1.66	2.2	0.14	8.5	5.14
Tanzania	17.6	0.53	2.0	0.05	4.8	0.81

From Table 5.3 it can be seen that the average Standard 6 pupil had a head teacher with a teaching experience of 17.6 years. Eastern zone had the highest mean of 22.6 years while by contrast Southwest zone had the lowest mean of 11.5 years. As expected, head teachers were more experienced than Standard 6 subject teachers (the average teacher had a teaching experience which ranged from around 12 and 14 years).

How many years of teacher training had school heads completed?

Head teachers require some pre-service training as teachers because first and foremost, they have to become professionally competent teachers in order to manage a school well. By virtue of their relatively complex leadership role which involves managing teachers and resources of various kinds, implementing the curriculum, and establishing as well as maintaining partnerships with the local community, the necessity of such training can not be over-emphasised.

In Tanzania the average number of years of teacher training for head teachers was two years. There was significant variation in the duration of teacher training among the zones. Southwest Zone had a mean of 2.3 years of teacher training implying that a good number of head teachers were drawn from those who trained for more than two years, and these are presumably Grade B teachers. On the other extreme, the mean number of years of teacher training for head teachers in Kilimanjaro zone was 1.7 years, implying that a good number of head teachers was drawn from those who trained for less than two years. It is presumed that the majority of them were Grade C and Grade A teachers who received pre-service for one year.

Have school heads received specialized training in school management?

Specialised training is important for head teachers since, as stated earlier, head teachers have to have requisite skills and competencies to manage the curriculum, school plans, and human as well as financial resources, to enhance partnerships with other stakeholders and promote the participation of the community around the school. In Tanzania it is a policy that every newly appointed head teacher receives specialized training in school management. This specialized training is offered at local and national levels by the Agency for Development of Educational Management (ADEM). In this study head teachers were asked to indicate whether they had received any specialized training in management and the duration in weeks which the training lasted, and their responses have been presented in Table 5.3.

In Table 5.3 it can be seen that the average Standard 6 pupil had a head teacher who received specialised training in management that spanned a total period of 4.8 weeks. There were variations among the zones. In Eastern and Western Zones head teachers had significantly

long periods of specialised training of 8.8 and 8.5 weeks respectively. In contrast, Mwanza and Southern Zone had fewest numbers of weeks of specialised training of 2.5 and 2.9 weeks respectively.

Overall, there were no emerging patterns in the three variables analysed except in the Eastern Zone where the average Standard 6 pupil had a head teacher with the highest teaching experience of 22.6 years and who received the longest specialised training in management. While school head experience and teacher training did not vary much, specialised training seemed to vary considerably across zones.

How many years of experience had school heads had as either a school head or an acting school head – in the current school and all together?

It is matter of common sense that a head teacher with long experience is more likely to manage a school more effectively than one with little or no experience. Yet it can be of added advantage for a head teacher who has headed more than one school because his or her experience is broader since each school has unique features that offer new learning opportunities. A question was asked for head teachers to indicate the number of years they had been head teachers in their present school and in all schools, and the results have been presented in Table 5.4.

Table 5.4. Means and sampling errors of school heads' years of experience as a school head

Zone	This school		Altogether	
	Mean	SE	Mean	SE
Central	2.7	0.60	5.6	1.01
Eastern	3.3	0.47	13.4	1.18
Kagera	3.0	0.65	6.6	1.58
Kilimanjaro	3.9	0.85	7.4	1.43
Mwanza	3.1	0.68	6.2	1.75
Northeast	4.2	1.46	5.6	1.47
Northern	5.1	1.58	10.5	1.53
Southern Highlands	3.3	0.95	9.2	2.53
Southern	4.0	1.08	7.4	2.09
Southwest	4.0	0.85	4.0	0.85
Western	2.9	0.45	5.9	1.40
Tanzania	3.6	0.34	7.9	0.58

In Table 5.4 it can be seen that the average Standard 6 pupil had a head teacher whose total duration of experience as head teacher was 7.9 years, with an average of 3.6 years in the schools they were heading during 2000. Variations among the zones ranged from a mean of 13.4 years in Eastern Zone to 4 years in Southwest Zone.

It can be observed that head teachers from all zones except the Southwest zone had prior experience of heading schools. Southwest zone had the most inexperienced head teachers while Eastern Zone had the most experienced head teachers. Thus Standard 6 pupils in the Southwest Zone were disadvantaged in that they were in schools headed by the least experienced head teachers. Since the appointment of school heads is decentralized, the district education offices in collaboration with school Inspectorate in Southwest Zone may wish to improve this situation in their future plans for appointing head teachers.

Policy suggestion 5.2. The Ministry's Inspectorate should investigate why the head teachers in Western Zone were predominantly inexperienced heads and advise the relevant District Education officials on their future appointment policy and practices so as to ensure a more equitable distribution of experienced school heads.

General Policy Concern 15:

What were the school heads' viewpoints on general school infrastructure (for example, electrical and other equipment, water, and basic sanitation) and the condition of school buildings?

School buildings, equipment and other school supplies and amenities of acceptable quantities and quality are necessary for the creation of a learner-friendly environment. It is for this reason that the Ministry prescribes certain benchmarks and standards for their provision.

School heads were asked questions on the state of the school buildings. The state of buildings ranged from: being 'in good condition', 'some minor repair', 'some major repair', and 'complete rebuilding'. Information on the availability of toilet facilities to both girls and boys was also examined. Information about rural or urban location of schools and the distance pupils had to travel to school were also examined. Finally, a range of other general facilities, other buildings, school grounds, general service, and equipment were examined and the number of school days lost per month. Head teachers' responses on general facilities (grouped in 4 clusters) have been listed in Table 5.1 through 5.4.

What was the general condition of school buildings?

It can be seen in Table 5.4 from the general school buildings cluster that only 4.2 percent and 7.0 percent of Standard 6 pupils were attending schools that had school halls and cafeteria respectively, and about half of them (52.3%) were in schools with storerooms. In addition, for every five pupils only one attended a school where there was a library.

These results reflect a serious deficiency of many of the general school buildings which clearly undermined the promotion of a reading and mathematics culture among pupils in the primary

education system. They support the earlier results cited in Chapter 3 where pupils were in classrooms with few or no storage facilities (around 16 percent cupboards and around 11 percent bookshelves) and almost no classroom library or book corner (around 5 percent had a classroom library).

About one third of Standard 6 pupils were in schools with no piped water/well or borehole, and most of them were in schools that had neither electricity nor telephone (only 15.5% and 8.8% of schools had electricity and telephone respectively).

Table 5.5. Percentages and sampling errors for schools with general facilities

Facility	Percentage with facility	
	%	SE
<i>School buildings</i>		
School library	20.2	3.51
School hall	4.2	1.55
Staff room	80.3	3.31
School head's office	78.9	3.30
Store room	52.3	4.11
Cafeteria	7.0	3.05
<i>School grounds</i>		
Sports area/playground	89.3	2.43
School garden	65.7	3.81
<i>General services</i>		
Piped water/well or bore-hole	64.2	3.84
Electricity	15.5	3.20
Telephone	8.9	3.30
<i>Equipment</i>		
First-aid kit	26.1	3.85
Fax machine	4.5	1.74
Typewriter	9.3	3.15
Duplicator	7.9	3.22
Radio	14.7	2.99
Tape recorder	1.1	0.79
Overhead projector	2.1	1.12
Television set	0.6	0.56
Video cassette recorder	0.0	0.00
Photocopier	0.0	0.00
Computer	2.1	1.04

What items of equipment (telephone, fax, photocopier) and general facilities (library, staff room, store room) did schools have?

The average Standard 6 pupil was in a school with very limited access to equipment, both conventional (such as radio, typewriter, and tape recorders) and microelectronics (like fax, computer, and television). For instance, whereas no Standard 6 pupil was in a school with a photocopier or a video cassette recorder (0.0% each), only 7.9 percent of them were in schools with a duplicator and 0.6 percent were in schools with a television set, which was very worrying. Under these circumstances the implementation of the school curriculum still faces a stiff challenge because it cannot benefit from the many opportunities offered by both traditional and modern technologies that facilitate teaching and learning, particularly computer- and internet-assisted teaching and learning which both characterise globalising educational systems.

Although the home environment of the pupils did not seem to compensate for the inadequacies of the school environment as evidenced by the general low socio-economic level of parents (possession index 3.4) reported in Chapter 3, the environment external to the home, particularly in towns and cities, is rapidly acquiring such facilities/equipment for public use, as is the case with the many internet cafés that are now available. Pupils, therefore, can still access the equipment that schools and homes do not have, but might not constructively explore their utility for lack of systematic guidance on their use. Nevertheless, those in the rural areas are less likely to access the equipment for reasons that have already been stated. Similarly, teachers in rural areas are also not likely to fully exploit the benefits offered by modern technology.

It is undisputable that some equipment is too costly for schools to purchase them from their meagre budgets. In addition, primary school budgets have over the years been dismally small because they are sustained by weak economies and largely impoverished local authorities which can only afford to give them modest allocations. However, after the introduction of PEDP each school has been funded directly by the central government and school authorities manage the funds and are accountable for their use. The local authorities in collaboration with school committees could mobilize some of the funds meant for the purchase of teaching materials to purchase some of the equipment and use them at school cluster level. Under the

school cluster approach, several adjacent schools can benefit through sharing scarce resources. This is the approach WABEM promotes as a strategy for improving management at school level and strengthening community participation at grassroots level.

On the whole, it is clear from the results presented that schools were poorly provided in terms of most equipment, services and facilities, and there was need to address this situation as a long term measure.

Repair status

School buildings need to be built according to ministry norms and specifications in order to suit school purposes. They should be safe to use, must promote the health of pupils, and should offer security for all school property housed in them. Once buildings have been constructed and are in use, they should be well-maintained through regular repair if they have to continue serving the purposes they are meant for.

The head teachers were asked to state the condition of their school buildings using a five-point scale with values as follows: '5' = in good condition; '4' = some minor repair; '3' = most minor repair; '2' = some major repair; and '1' = complete rebuilding. The buildings variable was recoded with categories '1' and '2' collapsed together to reflect the variable 'need repair' so that it was possible to figure out the percentage of Standard 6 pupils whose head teachers perceived that the schools needed repair. An analysis of their responses has been presented in Table 5.6.

Table 5.6. General condition of buildings and toilet facilities

Zone	Need repair		Toilet provision	
	%	SE	Mean	SE
Central	67.8	12.41	52.3	4.92
Eastern	37.6	14.06	131.2	20.07
Kagera	62.4	12.94	40.0	4.66
Kilimanjaro	39.7	13.48	40.0	5.82
Mwanza	94.6	5.42	140.4	73.69
Northeast	62.2	14.11	84.8	18.98
Northern	35.7	11.26	82.0	16.38
Southern Highlands	31.7	11.55	54.5	8.59
Southern	69.5	16.19	41.7	9.35
Southwest	47.3	14.75	57.3	13.73
Western	43.4	12.07	87.8	14.02
Tanzania	50.5	4.07	76.6	7.02

In Tanzania 50.5 percent of Standard 6 pupils were in schools that were perceived to require repair. Across the zones there were large variations ranging from a very high average of 94.6 percent in Mwanza Zone to a low average of 31.7 percent in Southern Highlands Zone. Five zones namely Mwanza, Southern, Central, Kagera and North Eastern Zones had more than half of their pupils in schools whose buildings needed repair and were presumably in bad condition. In addition to the on going efforts of building standard classrooms under PEDP, it is necessary for local authorities and local communities, especially in the five zones highlighted above, to mobilize extra resources to refurbish school buildings.

What was the nature and provision of toilet facilities in schools?

The availability of toilet facilities in schools enhances school hygiene and sanitation, and this contributes to a learner-friendly environment. On the other hand, when toilet facilities are inadequate or absent, they can cause absenteeism, especially for those girls who have reached puberty. The Ministry norm for toilet facilities is 25 boys per 1 toilet hole and 20 girls per 1 toilet hole. Head teachers were asked to indicate the number of toilets that were available in

their schools. This number was divided by the school's enrolment in order to obtain the ratio of pupils to a toilet. In cases where the school operated several shifts, the number of toilets was divided by the enrolment in the biggest shift. The school heads' responses have been presented in Table 5.5.

The national mean for toilet provision was 76.6. This implies that Standard 6 pupils in Tanzania were in schools where around 77 pupils shared one toilet hole. There were large variations ranging from a high mean of 140.4 in Mwanza Zone to a low mean of 40 in Kagera and Kilimanjaro Zones. The situation with regard to toilet provision appeared to be a serious one since there was not a single zone where toilet provision met the Ministry norms. However, in Mwanza and the Eastern Zones caution needs to be exercised in interpreting the results since they were associated with very big standard errors.

Policy suggestion 5.3. In addition to the ongoing construction of classroom buildings, toilets and teachers' quarters by the government under PEDP, MOEC in collaboration with PORALG and local communities should carry out a census of the buildings and toilet facilities that require major repairs or compete rebuilding in order to guide the on-going school reconstruction being implemented under PEDP and future ones so that more schools meet the Ministry norms for the inputs.

What was the classroom space available for pupils?

Classroom space available for the pupil defines the physical learning environment of the pupil in the classroom situation where most of the learning takes place. Adequate classroom space guarantees pupil comfort and promotes attention during instruction time. It also enables the teacher to reach out the pupils for individual support. The Ministry norm for classroom space per pupil is 1.4 square meters and this translates to a classroom size of 7 meters by 9 meters or a floor space of 63 square meters for the normal class size of 45 pupils. To figure out the classroom space available per pupil, the total area available for classroom space in the school was established and divided by the total school enrolment. The results of this analysis of the results have been presented in Table 5.7.

Table 5.7. Means and sampling errors of the classroom space available for pupils

Zone	Classroom space	
	Mean	SE
Central	0.9	0.17
Eastern	0.6	0.10
Kagera	3.1	1.09
Kilimanjaro	1.9	0.87
Mwanza	0.9	0.10
Northeast	0.7	0.14
Northern	1.9	0.70
Southern Highlands	1.4	0.60
Southern	1.4	0.27
Southwest	0.5	0.11
Western	1.4	0.43
Tanzania	1.3	0.16

Nationally Standard 6 pupils in Tanzania were in schools which satisfied the Ministry's norms regarding classroom space per pupil. The national mean was 1.3 square metres per pupil. Considering the standard error associated with it, this mean was within the Ministry norm which is 1.4 square meter per pupil.

Variations among the zones ranged from a high mean of 3.1 in Kagera to a low mean of 0.5 in Southwest Zone. Thus the high mean for Kagera appears to suggest that class area per pupil was too high, with more classrooms available than was required or there was under enrolment. In Southwest Zone the low figure suggested overcrowding in classrooms. With overcrowding it would not be uncommon to have open air classes or temporary classrooms in the zones since these are common options that schools with overcrowded classes resort to in order to alleviate the problem. Other zones with low class area per pupil were Eastern (mean = 0.6), Northeast (mean = 0.7), Mwanza and Central (mean = 0.9 each). The results for Eastern Zone reflected the situation on the ground especially in Dar es Salaam city where overcrowding was very serious. Some schools had enrolments of between 3 and 5 thousand pupils in a small number of classrooms, and this was well beyond the official maximum school size of 960 pupils.

It is obvious from the results that construction of more classrooms was needed especially in the Southwest, Eastern, Northeast, Mwanza and Central Zones. In zones with districts where school mapping has been conducted, construction could be guided by the school map reports. In addition, where resources do not allow new construction double shift arrangements could be adopted in order to optimize the use of available resources.

Policy suggestion 5.4. The Ministry and PORALG in collaboration with local communities should draw long term plans to build adequate school classrooms and other buildings. Double shift schools or multi grade teaching should be established as a temporary measure to alleviate overcrowding.

General Policy Concern 16:

What were the school heads' viewpoints on (a) daily activities (for example, teaching, school-community relations, and monitoring pupil progress), (b) organizational policies (for example school magazine, open days, and formal debates), (c) inspections, (d) community input, (e) problems with pupils and staff (for example, pupil lateness, teacher absenteeism, and lost days of school)?

The role of the head teacher, that of being in overall charge of the day-to-day running of the school as administrator and manager, places him or her at the centre of internal school's self assessment. It was considered important to get the views of the head teachers on a number of important domains that were relevant to the management of the school. The domains included (a) daily activities for example, teaching, school-community relations, and monitoring pupil progress), (b) organizational policies (for example school magazine, open days, and formal debates), (c) inspections, (d) community input, (e) problems with pupils and staff (for example, pupil lateness, teacher absenteeism, and lost days of school)?

What amount of teaching did school heads undertake?

Head teachers are experienced teachers and it is a common practice to find them teaching. Nevertheless, because of their management role they often teach fewer periods than ordinary teachers do. It was desirable, though that every head teacher does some teaching so that he or she can remain conversant with developments at the classroom level. In some cases, the head teacher may have to demonstrate good teaching, and so they have to be good teachers themselves. However, a head teacher is a manager and administrator, and excessive teaching loads can compromise his or effectiveness in the performance of this role. In this study head teachers were asked to indicate the time (in minutes) they spent teaching per week. Their responses have been presented in Table 5.6.

Table 5.8. Means and sampling errors for amount of school head teaching per week

Zone	School head teaching minutes per week	
	Mean	SE
Central	834.1	121.45
Eastern	559.4	109.36
Kagera	865.9	68.59
Kilimanjaro	763.6	69.55
Mwanza	922.5	112.85
Northeast	736.0	67.09
Northern	823.9	112.25
Southern Highlands	768.7	126.11
Southern	1077.7	107.90
Southwest	893.9	110.78
Western	1234.6	152.45
Tanzania	853.4	38.22

In Tanzania the average Standard 6 pupil was in a school where the head teacher's mean teaching time per week was 853.4 minutes. Translated to the number of periods, the average workload was 21.33 periods per week or 4.26 periods per day.

Western and Southern Zones had the highest means where the average Standard 6 pupil was in a school where the head teacher's mean teaching load per week was 1,234 minutes and 1077.7 minutes respectively. By contrast, Eastern Zone had the lowest mean of 559.4 minutes. Put differently, head teachers in the Eastern Zone had less time for teaching and hence presumably more time for school management.

Based on these results head teachers in Tanzania were doing considerable teaching in addition to their management role. Given that they had a heavy teaching workload, in many cases very much like that of the ordinary class teacher, it is of concern if this state did not

impair their effectiveness and efficiency as managers. Furthermore, since the head teacher is the internal supervisor, he or she must have sufficient time for this function.

Policy suggestion 5.5. ADEM in collaboration with the Inspectorate Department, Tanzania Institute of Education and should investigate how head teachers' participation in class teaching impacted on their ability to fulfil the demands of their management role and use the results to set a norm for the amount of teaching that head teachers should observe.

What was the incidence of school activities such as a school magazine, public speaking day, open days, etc.?

Effective schools usually have a broad range of school activities that created additional opportunities for pupils to learn and to develop talent. Some of these are the production of a school magazine that pupils can contribute to, holding public speaking days, and having open days. Head teachers were asked to indicate how they participated in selected four school activities, namely, school magazine, public speaking day, open door policy and formal debates or debating contests. These activities have the potential to bringing together pupils, teachers, parents and community members in exchanging views on a variety of issues that affect teaching and learning. In Table 8.2 their responses have been presented.

Table 5.9:. Percentages and sampling errors for the school activities

Activity	Percentage of school activities	
	%	SE
School Magazine	7.2	2.01
Public Speaking Day	21.7	3.81
Open-Door Policy	80.9	3.20
Formal Debates or Debating Contests	39.1	4.18

From Table 5.9, it can be seen that the most common school activity was the open door policy where the percentage of Standard 6 pupils with head teachers who indicated that they used the open door policy was 80.9 percent. School magazine was the least common activity, with only 7.2 percent of Standard 6 pupils with head teachers who indicated that their schools had school magazines. This is probably because school magazines require considerable resources to produce. It is noteworthy, though, that whereas most of the schools did not have

school magazines, more than half of them did not promote public speaking days and formal debates or debating contests either.

School magazines are among the activities that would regularly and effectively communicate what is happening at school to the community. They promote a reading and writing culture and interest in school affairs among pupils and community members. Furthermore, public speaking days and formal debates or debating contests are vital strategies that enhance pupil talent such as in expressing themselves and in confidence building. These and others are vital extracurricular activities that deserve wider practice among schools and should be encouraged by school managements, ward, district education officials and school inspectors.

Policy suggestion 5.6. Schools inspectors in collaboration with Ward Education Coordinators should explore mechanisms for motivating schools to institutionalize the production of school magazines and the popularisation of public speaking days and debating contests.

How many school days were lost in the last school year due to non-school events?

The school calendar is designed in such a way that it reflects the optimum number of days required by learners to complete and master designated elements of the school curriculum. Therefore, when pupils lose some days, their learning is compromised. In Tanzania pupils are supposed to attend school for 194 days per year. They spend between 3 and 5 hours per school day. Head teachers were asked to indicate number of official school days lost in the last school year (1999) due to non-school events, and the results have been presented in Table 5.10.

Table 5.10. Means and sampling errors for number of official school days lost

Zone	Average of official school days lost	
	Mean	SE
Central	15.8	3.84
Eastern	10.4	2.67
Kagera	22.5	3.50
Kilimanjaro	6.7	1.86
Mwanza	14.0	1.81
Northeast	13.1	2.78
Northern	8.1	1.87
Southern Highlands	10.9	2.36
Southern	15.9	3.02
Southwest	9.9	3.67
Western	8.3	1.68
Tanzania	11.5	0.80

In Table 5.10 it can be seen that Standard 6 pupils attended schools where head teachers stated that, on average, 11.5 school days were lost due to non-school events during year 1999, which is 11.34 percent of the total number of school days lost per year.

There were large variations among the zones. Kagera had the largest number of school days lost (22.5days) per year whereas Kilimanjaro had the least number of school days lost (6.7 days) per year.

The results show that considerable learning time was lost by pupils as a result of non-school events in primary schools, and this deserved attention by local authorities, especially in Kagera Zone.

What were the purposes and frequency of school inspections?

The role of inspectors in Tanzania is both advisory and inspectoral. Inspectors are responsible for quality control and quality assurance in the delivery of education. In carrying out their roles, inspectors conduct three types of inspections, namely, whole school inspection; follow

up inspection and special inspection. Each school in the country is expected to be subjected to a whole school inspection at least once in three years and each inspector is expected to inspect 40 schools in each financial year. Whole school inspection lasts for between three five days for post primary institutions and between two and three days for primary schools. Head teachers were asked to explain their views on the purpose of each type of inspection they were subjected to during three-year period, that is 1997 up to 2000, and their responses have been presented in Table 5.8.

Table 5.11. Percentages and sampling errors for school inspections

Purpose of inspection	Inspection took place in past 3 years	
	%	SE
Full inspection	76.9	3.30
Routine inspection	34.7	3.83
Inspect teachers – <u>not</u> for promotion	13.5	2.73
Inspect teachers – <u>for</u> promotion	6.9	2.03
Assist teachers	47.6	4.26
Advise the school head	41.4	4.21
Address crisis/problem	8.5	2.14
Courtesy call	40.9	4.21

The results show that inspectors were mainly carrying out full inspection, 76.9 percent of Standard 6 pupils being in schools which were fully inspected. There were 47.6 percent of head teachers who indicated that inspectors came to assist teachers, a result which was expected, since it is also their duty to provide teacher support. A rather worrying result was spending inspector's time on courtesy calls (40.9%). While head teachers' perceptions indicated that inspectors executed their inspectoral and advisory roles, the results also show that inspectors visited schools to make simple courtesy calls just as frequently as they visited them to provide teacher support. In a system where schools are largely rural, teacher support mechanisms like teacher resource centres are not well established and the majority of teachers are under-qualified academically. In such a situation, a great deal of inspectors' time should ideally be set aside for the provision of professional and academic support to teachers. These results warrant attention by the department of school inspection so that the advisory role is given greater emphasis.

Policy suggestion 5.7. The Department of School Inspection should review its mode of operation to ensure that more inspectors' time is spent on the advisory function rather than on courtesy calls.

What was the contribution of the school community (in terms of time and resources for maintaining the school and for providing supplementary funding)?

Parent/Community contributions to the school

Community or parent participation in school activities is a catalyst to school development. The engagement of a wide range of activities of community members and parents strengthens school management and school-community partnership. Schools can use community resources to enhance the teaching/learning process and the community on the other hand can use the school as a facility for influencing curriculum and for improving their own knowledge.

The head teachers were asked to describe their perceptions on the type of community contributions. The results of the responses have been presented in Table 5 9.

Table 5.12. Parent/community contributions to the school

Type of contribution	Pupils in school with community contributing to	
	%	SE
Building of school facilities	91.4	2.04
Maintenance of school facilities	78.2	3.80
Construction/maintenance and repair of furniture/equipment	74.3	3.58
The purchase of textbooks	39.3	3.97
The purchase of stationery	54.8	4.09
The purchase of other school supplies	55.2	4.18
Payment of examination fees	70.1	4.04
Payment of the salaries of additional teachers	4.6	1.55
Payment of an additional amount of the salary of teachers	1.2	0.79
Payment of the salaries of non-teaching staff	31.2	3.61
Payment of an additional amount of the salary of non-teaching staff	10.7	3.21
Extra-curricular activities	27.3	4.02
Assisting teachers in teaching without pay	14.1	2.89
Provision of school meals	17.7	2.78

It can be seen that ‘building of school facilities’ was rated highest (91.4 %) form of parental or community contribution. Other contributions that head teachers rated high were ‘maintenance of school facilities’ (78.2 %), ‘construction, maintenance, and repair of furniture/equipment’ (74.3 %) and ‘payment of examination fees’ (70.1 %). Head teachers rated ‘payment of additional amount of the salary of non teaching staff’ lowest (1.2%), followed by ‘payment of salaries of additional teachers’ (4.6 %).

The results revealed that community contribution has been mainly in construction/repair of school buildings, furniture, and purchase of school supplies and payment of examination fees. Unfortunately these contributions can be executed with the minimum involvement of parent/community. In addition, they did not allow for a wide spectrum of activities for community participation. Thus mechanisms to promote wider school-community/parent partnership and participation should be developed, more so in view of the fact that the management of the primary education system has been decentralized.

What were the main behavioural problems of pupils?

There are many factors that influence the behaviour of pupils, some of which are in-school factors and some are out of school factors. The school, home, neighbourhood, peer group, and the media shape the behaviour of pupils and in turn personalities and general societal values. Head teachers were asked to indicate their perception of the frequency of both pupils' and teachers' selected behavioural problems. Eighteen (18) behavioural problems for pupils and ten (10) for teachers were listed. The responses ranged from 'never', 'sometimes' and 'often'. In Table 5.13 the responses of head teachers indicating pupil behavioural problems that *never* occurred have been presented.

Table 5.13. Pupil behavioural problems

Frequency of pupil behavioural problem	Indicating 'never' occurs	
	%	SE
Arriving late at school	1.8	0.93
Skiping classes	13.3	2.57
Dropping out of school	6.4	2.29
Classroom disturbance	12.5	2.75
Cheating	12.8	2.85
Use of abusive language	24.4	3.91
Vandalism	20.5	3.44
Theft	20.9	3.53
Intimidation of pupils	25.2	3.61
Intimidation of teachers/staff	56.2	4.08
Physical injury to staff	87.4	2.68
Sexual harassment of pupils	49.8	4.21
Sexual harassment of teachers	78.4	3.37
Drug abuse	84.7	2.90
Alcohol abuse	85.7	2.92
Fights	20.8	3.79
Health problems	1.1	0.73

The most common pupil behavioural problem in Tanzania primary schools was health. Only 1.1 percent of Standard 6 pupils were in schools where head teachers stated that 'health

problems' never occurred. That is to say 98.9 percent of Standard 6 pupils were in schools where head teachers stated that health problem occurred. Other very highly rated common problems were 'arriving late at school' and 'dropping out of school'. Close to 2 percent of Standard 6 pupils were in schools where head teachers stated that 'arriving late at school' never occurred and 6.4 percent of them were in schools where head teachers stated that 'dropping out of school' never occurred. The second set of problems would be expected where, as noted already, ill health, the most common problem pupils experience, would most presumably result in or aggravate their coming late to school or dropping out of school. By contrast, the least common pupils behavioural problems were 'physical injury to staff' followed by 'alcohol abuse', and 'drug abuse'. Around 87 percent of pupils were in schools with head teachers who stated that 'physical injury' never occurred while 85.7 percent and 84.7 percent respectively of the pupils were in schools with head teachers who stated that 'alcohol abuse' and 'drug abuse' never occurred respectively.

It is important to note that, on the basis of the analysis, more than 50 percent of Standard 6 pupils were in schools where head teachers encountered other worrying common behavioural problems, namely, 'classroom disturbance', 'cheating', 'use of abusive language', 'skipping classes', 'vandalism', 'fights', 'theft', 'intimidation of pupils' and 'sexual harassment'.

It is disturbing to note that altogether 12 out of the 18 listed behavioural problems appeared to be common in the primary education system (that is, more than 50% occurring). Even more disturbing is the fact that 6 out of 10 common behavioural problems were to do with pupil conduct, which raises a social concern nationally on the kind of values and attitudes the education system and the community as a whole inculcates in pupils.

Pupils' behavioural problems ranged from ill health, late coming, and dropping out of school to vandalism, fights, theft, and sexual harassment. Of course, it is unexpected that schools would experience no problems of late coming, absenteeism, and other similar problems. Nevertheless, there are some problems that occur less frequently, but that should be a cause for concern. The results presented, therefore, suggested three worrying messages to the education system and the community.

Firstly those pupils were frequently affected by diseases. The ministry school health norms include that every school should provide first aid services through having a first aid kit and or

through the provision of a health centre nearby. However with these results it is highly unlikely that the potential of the existing practices was fully utilized. Hence re-examination of health services mechanisms to pupils with a view to improving pupils' health care and health monitoring system is warranting.

Policy suggestion 5.8. The Ministry in collaboration with PORALG should establish a health programme for each school where pupils are regularly examined and treated. The existing first aid system in many schools should be integrated to the programme and strengthened by ensuring that each school has at least a male and a female teacher trained in providing first aid services.

The second was the poor conduct of pupils which undermined the personalities and values of pupils while they were at school (including the higher levels of schooling) and after school. Behaviours like thefts, vandalism, fights collectively were a potential threat to peace and security, and were a violation of human rights. Thirdly, pupils were vulnerable to sexually transmitted infections, including HIV/AIDS, due to sexual harassment. It is obvious that the results were indicative of the failure of both the school system and the society/community in bringing up a young generation who meet national expectations, a generation that is honest, tolerant, healthy, civilized, and that takes responsibility for own property and that of the schools, families and community. The results attest to the common public outcry that ethics and moral values in society have decayed and deserve due attention by relevant social organizations. School systems, for their part, should work out mechanisms for nurturing desirable values and behaviour among pupils.

Policy suggestion 5.9(a). The Ministry should ensure that primary, secondary and teacher education curricula facilitate the inculcation of values and attitudes that are cherished by the communities they serve, and by Tanzania as a nation.

Policy suggestion 5.9(b). The Ministry should design and establish a school community/parent information system that tracks pupils' behaviour and use the information for remedial actions which include counselling.

Policy suggestion 5.9(c). The Ministry in collaboration with the Ministry of Labour and Social Works should establish external referrals to provide probationary service to juvenile delinquents where cases are on the extreme.

What were the main behavioural problems of teachers?

Teachers are normally expected to observe certain ethics of the teaching profession as well as regulations set by the Ministry of Education and Culture. Besides, teachers' behaviour must

be exemplary so that they can serve as role models. It is important, therefore, to know the extent to which teachers live up to these ideals, Head teachers were asked to indicate behavioural problems related to their teachers and in Table 5.14 their responses have been presented.

Table 5.14. Teacher behavioural problems

Frequency of teacher behavioural problem	Indicating ‘never’ occurs	
	%	SE
Arriving late at school	6.0	1.62
Absenteeism	39.8	4.19
Skipping classes	33.2	4.13
Intimidation or bullying of pupils	75.4	3.40
Sexual harassment of teachers	85.5	3.48
Sexual harassment of pupils	81.9	3.09
Use of abusive language	72.0	3.69
Drug abuse	95.6	1.49
Alcohol abuse	81.5	2.94
Health problems	17.3	3.03

‘Arriving late at school’ was the most common teacher behavioural problem followed by ‘health problem’. Only 6.0 percent of Standard 6 pupils were in schools where head teachers stated that arriving late at school never occurred and 17.3 percent of them were in schools where head teachers stated that health problems never occurred. Interestingly, except for the order of rating, these problems were similar to those rated as being the most common among pupils. However, the fact that their percentages were higher than those for pupils implied that their frequency of occurrence was less for teachers than for pupils.

The most highly rated teacher behavioural problems (i.e. never occurs) were ‘Drug abuse’ (95.6 %), ‘sexual harassment of teachers’ (85.5 %) and ‘sexual harassment of pupils’ (81.5 %). Drug abuse was also among the least common problems for pupils.

Taken together, the most common problems among teachers and pupils (as reported in the earlier section) were ‘health’ and ‘arriving late at school’ and the least common was ‘drug abuse’. It is unfortunate to note that both pupils and teachers were frequently afflicted by

health problems. Health problems could, as stated earlier, arguably aggravate the second problem of arriving late at school. Arriving late at school undermines time on task for both pupils and teachers. If pupils are frequently sick they cannot learn effectively and if teachers are frequently sick they cannot discharge their teaching duties effectively.

The health of the school community should be a matter that will in future receive attention on a routine basis because the government established the National Health Insurance Fund for civil servants which came into effect in 2002.

Policy suggestion 5.10. The Ministry in collaboration with PORALG should ensure that the National Health Insurance fund for civil servants benefits all teachers ideally by year 2005 so that all teachers become assured of regular health checks and treatment.

Conclusion

In this chapter the focus was an examination of the head teacher characteristics and their viewpoints on classroom facilities, teaching and behavioural problems with respect to pupils and teachers.

Research results revealed very wide gender disparities among head teachers. In Southern Highlands Zone there were no female head teachers. It was advised that the local authorities' policy on appointing and deploying school heads should ensure that male and female head teachers are well represented and more equitably distributed.

The Ministry in collaboration with PORALG were advised to repair school buildings and construct more toilets with the involvement of local communities in order to address the problem of dilapidated buildings and inadequate toilet facilities, problems which were very severe in some zones. It was also noted that many schools lacked essential infrastructure such as libraries and store rooms, services such as telephones and electricity, as well as equipment such as duplicating machines, radios and other equipment. Long-term efforts were needed in order to address these shortages. Furthermore, school should enhance their pupils' opportunities for learning by implementing a broad range of school activities, among them

the production of a school magazine and holding open days as well as public speaking days, among others.

With regards what the community contributed to the school, advice emphasised the need for wider participation and stronger partnership with the community to ensure that the community's participation goes beyond mere involvement in the provision of school facilities.

On the problems with pupils and staff a range of suggestions was made to MOEC and other relevant ministries including establishing a regular mechanism to monitor pupil health. The implementation of a National Health Insurance scheme for civil servants that benefits teachers in the shortest period was suggested. Other suggestions were to establish Management Information Systems (MIS) at the school-community level to track pupils' behaviour and the establishment of referral services for extreme cases of delinquency. An assortment of pupil behavioural problems was also common among teachers, namely, illness and coming late to school. However, several other problems of concern were common among pupils only, and among them were classroom disturbance, cheating, vandalism, theft, use of abusive language, and sexual harassment. The challenge of regulating primary school pupils' behaviour was enormous and requires the concerted efforts of relevant government sectors and the general community.

Chapter 6

Equity in the Allocation of Human and Material Resources among Zones and among Schools within Zones

Introduction

The first objective of any education system is to enrol children and retain them in school. Thereafter, the next challenge is to ensure that children enrolled learn what they are supposed to learn at school, and that all of them have an equal opportunity to do so. One way of doing this is to ensure that there is an equitable distribution of resources across the zones. Equitable allocation of resources can contribute to redressing the differences in achievement among schools and in turn differences in achievement among pupils. This chapter therefore examines the extent to which human and material resources among zones and among schools are equitably distributed. It focuses on the allocation of teachers and head teachers in terms of their experience and academic qualifications. Further focus is on how classrooms, teaching materials, and schools facilities are distributed.

In grappling with the equity issue, the Government of Tanzania's thrust between 1997 and 2003 has been, among other things, to carry out school mapping in all 121 districts in order to address the issue of access to and equitable distribution of resources in primary schools with respect to the different demands in different localities. More than 90 districts have been school mapped and a general picture established on the education needs of the districts. Up till year 2001 in Tanzania, the provision of learning resources in primary education had been the joint responsibility of local communities and the government. The local government authorities, local communities (including parents) shared the responsibility of providing pupils with classroom supplies such as textbooks and furniture, and the construction of classrooms and other school buildings. With the introduction of PEDP in year 2002, the government has assumed a greater part of the responsibility of providing resources to schools. Communities, however, continue to assist government efforts wherever they can and where it is necessary.

Before PEDP was introduced, the level of provisions in primary schools was highly dependent on the wealth of the parents and communities surrounding the school as well as the extent of community awareness on the value of education. The PEDP priorities include equitably providing basic resources among schools to minimize the inherent differentials.

In this chapter, areas where there are differences in the allocation of resources have been identified. In particular, attempts have been made to establish whether these differences were greater among zones or whether they were larger among schools within zones. Emphasis has been placed on the inequities in the distribution of resources and not on absolute levels of provision. Therefore the results presented here should be related to that presented in previous chapters that dealt with human and material inputs

Two approaches to the measurement of equity

For equity measurement, the study has employed two approaches namely:

- a) Variation among zones
- b) Variation among schools within zones

a) Variation among zones

A statistic called the coefficient of intra-class correlation (ρ) may be used to divide the variation in resource inputs into two components, namely: (a) among zones and (b) among schools within zones. ρ can range from around zero (0.0) to 1.0. When used in this way ρ is a ratio that can measure the percentage of total variation among schools that can be attributed to variation among zones. The residual figure measures the average variation among schools within the zone.

To appreciate the meaning of ρ , it is useful to consider two hypothetical school systems: system A and B. In system A, resources are allocated equally or nearly equally, to all schools and therefore when one calculates average resource levels for zones in the system one finds that these are more or less the same – except perhaps for some minor chance deviations. For such a school system, the value of ρ would be close to zero because the variation among

zones is associated with chance differences. That is, most of the variation among schools is due to variation among schools within zones.

On the other hand, consider system B where, because of administrative decisions, historical factors, or geographical dispersion of social class groups, there are large variations among zones. Most of the variation among schools in this case would be due to variation among zones and there would be little variation among schools within zones. For such a school system the value of rho would be high (perhaps approaching unity) because most of the variation among schools could be accounted for by variation among zones.

The above examples describe two extremes that serve to illustrate the interpretation of rho. When using rho in policy discussions it is common practice to multiply the value by 100 in order to present a more readable discussion about 'percentage of variance'. For example, a rho of 0.20 means that 80 percent of the differences are among schools within zones and 20 percent among zones. In contrast, a rho of 0.80 would indicate that 80 percent of the differences among schools were associated with variation among zones and 20 percent among schools within zones.

b) Variation among schools within zone

It is also possible to quantify the differences among schools within a particular province by making a comparison with the variation among schools at the national level. This can be achieved by using the formula below:

$$\frac{\text{Standard deviation for schools in a zone}}{\text{Standard deviation for schools in the nation}} \times 100$$

The standard deviation of an indicator for a particular zone measures the amount of variation among schools within that zone, whereas the standard deviation for the whole country measures the amount of variation among schools for the nation. The ratio of the standard deviation of an indicator for a zone to the standard deviation for the nation, expressed as a percentage, provides a measure of the degree of equity within a zone compared with the national picture.

To illustrate the interpretation of these ratio values it is helpful to consider two hypothetical zones: zone A and zone B. Assume that the levels of a resource are measured by an indicator that has a ratio value of 50 percent for zone A and 150 percent for zone B. That is, the variation in resource levels among schools in zone A is 50 percent less than the variation in resource levels among schools for the whole nation; and the variation in zone B is 50 percent higher than for the nation. From these values it can be said that, compared with the national picture, there has been an equitable allocation among schools within zone A. In contrast, the Ministry should be concerned about zone B because there is clear evidence of major inequities among schools in this zone when compared with differences among schools for the whole country.

General Policy Concern 17:

Have human resources (for example, qualified and experienced teachers and school heads) been allocated in an equitable fashion among zones and among schools within zones?

Were qualified and experienced Standard 6 teachers and school heads distributed equitably among zones and among schools within zones?

In Table 6.1 the variations of human resource inputs among schools and zones by their different characteristics have been reported in columns 1-12. In column 1-11 the equity measurement of human resource input (a) among schools within zones and (b) among zones in column 12 have been reflected.

In the first 11 columns the variations among schools in the zones have been reported as the standard deviations of the human resources among schools in each zone expressed as a percentage of standard deviation among schools for the human resources at the national level. That is to say, if the percentage is below 100 the variations of resource level in schools in the zone is less than the variations of resource level in schools for the whole nation and vice versa.

Table 6.1. Equity of human resource allocation as assessed by (a) variation among schools within zones, and (b) variation among zones

Human resources	Variation among schools within zones											Variation among zones (rho x 100)
	1	2	3	4	5	6	7	8	9	10	11	
Reading teacher professional qualifications	117.9	64.5	123.5	75.6	127.9	62.4	101.6	85.4	128.5	77.3	110.8	0.9
Reading teacher experience	105.0	102.5	71.9	89.1	96.5	107.7	86.4	93.2	128.1	100.1	108.2	2.6
Math. teacher professional qualifications	71.5	62.0	111.5	119.2	106.2	86.0	106.7	121.7	132.9	68.8	86.3	0.0
Math. teacher experience	99.2	85.1	122.4	117.1	94.2	80.2	100.7	80.8	81.8	105.3	95.7	6.6
School head professional qualifications	62.3	131.7	92.4	110.0	85.1	116.0	73.2	57.9	118.3	122.8	101.5	6.1
School head experience	86.9	61.2	117.1	70.9	95.9	63.2	106.3	102.4	107.2	83.9	122.3	8.1
Inspectors/ advisors visits for reading teachers	74.1	91.2	82.8	116.7	120.4	109.0	81.7	101.0	93.9	118.2	94.0	2.4
Inspectors/advisors visits for math. teachers	106.2	79.0	90.1	102.6	107.2	112.5	87.6	107.1	91.8	112.5	101.9	0.0
Pupil/teacher ratio	87.7	2.3	3.6	64.8	81.2	11.2	2.9	9.0	0.0	0.0	.8	14.1

Note: 1=Central; 2=Eastern; 3=Kagera; 4=Kilimanjaro; 5=Mwanza; 6=Northeast; 7=Northern; 8=Southern Highlands; 9= Southern; 10=South West; 11=Western.

In the last column of the table it can be seen that variations among zones were quite low as evidenced by the low values of rho except for the pupil/teacher ratio factor where rho value (multiplied by 100) was 14.1. Some attention nationally will be required to bring a more equitable distribution of teachers across the zones.

Policy suggestion 6.1(a). The Ministry should collaborate with PORALG with a view to deploying teachers more equitably based on the results of the analysis of existing inequities.

Variations for allocation of teachers among the schools in each of the 11 zones were wide and the extreme ones (using a cut off point of 120) with the corresponding human material resource in brackets were Eastern (for head teacher professional qualification, pupil/teacher ratio), Southern (for mathematics and reading teacher professional qualification, and reading teacher experience), Kagera (for mathematics teacher experience, reading teacher professional experience), Mwanza (for inspectors/advisors visits for mathematics teachers and reading teacher professional experience), Southern highlands (for mathematics teacher professional experience), Southwest (for head teacher professional qualification) Western (for pupil/teacher ratio, head teacher experience). In-depth analysis of the distribution of teachers would be needed to redress the inequities. However, careful strategies which take into account other factors pertaining to teachers' perceptions on school conditions and their satisfaction will be required.

Policy suggestion 6.1(b). The Ministry's Inspectorate department should undertake an in-depth analysis of distribution of teachers among schools in Eastern, Southern, Kagera, Mwanza, Western, Southern Highlands, Southwest and Western Zones and propose strategies for redressing the inequities.

General Policy Concern 18:

Have material resources (for example, classroom teaching materials and school facilities) been allocated in an equitable fashion among zones and schools within zones?

Were (a) general school infrastructure, (b) classroom equipment, and (c) classroom teaching materials distributed equitably among regions and among schools within regions?

Equity of material resource allocation among schools within zones, and among zones was assessed and the results have been reported in Table 6.2.

Table 6.2. Equity of material resource allocation as assessed by (a) variation among schools within zones, and (b) variation among zones.

Material resources	Variation among schools within zones											Variation among zones (rho x 100)
	1	2	3	4	5	6	7	8	9	10	11	
Classroom furniture index by reading teacher	91.5	100.9	105.8	107.6	63.0	132.3	95.6	83.7	109.8	74.6	77.0	9.8
Classroom furniture index by mathematics teacher	101.0	82.1	85.6	143.1	81.2	124.8	72.6	92.7	88.6	81.2	121.6	0.0
Toilets per pupil	25.8	94.4	17.7	30.0	252.6	84.8	111.7	59.1	44.1	60.9	78.2	9.7
Classroom library by reading teacher	0.0	107.3	129.2	129.2	0.0	129.2	82.1	101.7	142.9	98.1	84.2	0.0
Classroom library by mathematics teacher	0.0	54.2	177.9	177.9	0.0	0.0	113.1	101.1	0.0	40.5	113.1	0.0
Classroom space per pupil	28.7	18.5	188.2	136.7	14.2	82.9	143.7	104.1	29.9	13.8	72.6	4.0
Reading teacher housing quality	111.7	95.4	123.7	111.9	72.2	111.9	112.0	74.8	133.0	105.2	36.8	0.7
Mathematics teacher housing quality	84.5	136.3	0.0	139.4	0.0	107.2	101.0	124.4	118.6	0.0	72.0	4.7
School resources index	100.2	117.1	90.5	104.6	87.9	93.6	106.0	112.7	68.9	87.0	82.1	4.6

Note: 1=Central; 2=Eastern; 3=Kagera;4=Kilimanjaro; 5=Mwanza; 6=Northeast; 7=Northern; 8=Southern Highlands; 9= Southern; 10=South West; 11=Western.

The variations among schools within the zones have been reported in the first 11 columns as the standard deviations of the resources among schools in each zone expressed as a percentage of standard deviation among schools for the material resources at the national level. The variations among zones in material resources have been reported in the extreme right column as rho expressed as percentage of variance.

It is clear from Table 6.2 that in each of the six material resources there were considerable variations among schools within some zones compared to the national variation. The largest variations among schools in material resources (using the cut off point of 120%) were found for the several zones with regard to the provision of classroom furniture. In Northeast, there were variations in the provision of classroom furniture by reading and mathematics teacher (132.3% and 124.8% respectively) and in Kilimanjaro by mathematics teacher (143.1%). The variation, for instance, of the classroom furniture among schools for the Northeast Zone (by reading teacher) was 32.3 percent higher than the variation among schools for the nation as a whole. By contrast, Mwanza Zone had the lowest percentage in the index (by reading teacher) of 63.0 percent, implying that the variations among schools in the zone were 37 percent lower than the variations among schools for the nation as a whole.

Other notable variations were related to the provision of toilet facilities in Mwanza (252.6%); classroom libraries in Kagera and Kilimanjaro by mathematics teacher (177.9% each); classroom libraries in Kagera, Kilimanjaro, Mwanza (129.2% each) and in Southern Zone (142.9%) by reading teacher, the classroom space variable in Kagera, Kilimanjaro and Northern Zones (188.2%,136.7%,143.7 respectively); teacher housing quality in Kagera and Southern Highlands (123.7% and 133.0 % respectively) by reading teacher and in Eastern, Kilimanjaro, and Northern Zones (136.3%, 139.4%, 124.4% respectively) by mathematics teacher.

The results for toilet per pupil in Mwanza which had a percentage variation of more than one and a half times (252.6%) that of the national variation and for classroom space per pupil variable in Kagera Zone with a percentage variation of 188.2 percent were very worrying. In both cases a follow up was needed to establish which schools were most affected. The

ongoing government efforts of supplying schools with resources could integrate an audit of the resources and target the worst affected zones in the stated variables.

The results of variations among the zones for the six variables measured by rho values have been presented in the 12th column. It can be seen that rho values (expressed as percentages) were very small for each of the variables. That is to say, the distribution of material inputs was reasonably equitable among zones and that existing variations were largely attributed to differences among schools within the zones. The highest value of rho was 9.8 percent in the classroom furniture index, implying that 9.8 percent of the variation in the distribution of the furniture in schools was due to differences among zones and 91.2 percent was due to the differences among schools within zones. The rho value of zero for classroom library by both reading and mathematics teacher and for classroom furniture index by mathematics teacher appeared to suggest a near equal state of distribution of the listed material resources among zones, which seemed to tally with the earlier findings on the classroom library and classroom furniture in Chapter 3.

Policy suggestion 6.2. The Regional and District Education Authorities should carry out an audit of the available material resources in schools with a focus on the zones where extreme inequities were noted, namely, Kilimanjaro, Kagera, Eastern, Northern, and Mwanza and Southern Highlands, and draw up a list of the resources which need to be supplied to the worst affected schools. A formula for resource allocation that will ensure a more equitable distribution of resources should be used in future, and such a formula should take into account a prioritised set of resources needed by every school. The priorities should be used to guide the use of PEDP funds so that there is greater focus on those areas with the greatest need.

Conclusion

In this chapter an attempt was made to explore the concept of equity in the allocation of human and material resources (a) among zones and (b) among schools within zones. The results show greater differentials for the material resources as well as human resource inputs among schools within zones than differentials caused by inequities in their distribution at national level (variations among the zones).

Generally, available evidence suggests that there was a reasonably equitable distribution of most of the variables (human and material inputs). Nevertheless, the variations among the zones in the distribution of teachers under the pupil/teacher variable deserved some attention.

Disparities among schools within zones with regard to a number of material resource inputs especially in the pupil per toilet, class library, and classroom space per pupil variables were noted. Under the human resource inputs, disparities were particularly associated with the teacher/pupil variable followed by the teacher professional experience variable. A proposal was made to identify the schools that had the most deficiencies and to take corrective measures that took account of PEDP fund.

Chapter 7

The Reading and Mathematics Achievement Levels of Pupils and their Teachers

Introduction

The learning outcomes of reading and mathematics tests for Standard 6 pupils and their teachers have been presented in this chapter. These results have been presented in three ways. Firstly, they were presented in the classical way where mean scores have been used. Secondly, they have been presented using the benchmark standards of ‘minimum’ and ‘desirable’ levels set by Tanzania’s national specialists. This was necessary since the tests were set out of a hybrid of all curricula of participating countries, and therefore specialist benchmarks were considered reasonable to identify the items that they felt a learner should (a) be able to answer so as to barely follow the Standard 7 program (that is, the minimum level), and (b) be able to master to be guaranteed success in the Standard 7 programme (that is, the desirable level). The third way in which scores have been presented is based on the Rasch model which was used to locate levels of competencies or skills against the level of test item difficulty to assess mastery of skills or competencies of Standard 6 pupils and their teachers. In this approach a pupil reaching one level would have an even chance of getting an item right in the level but would not have chances to get an item right in the higher levels for lack of mastery of skills or competencies required to get an item right at these levels. Details of levels of competency have been presented in Chapter 2. Analyses have been presented by gender, socio-economic status of both pupils and teachers, and the location of schools.

The results of learning achievement using combined approaches in assessing the pupils’ achievement and teachers’ competencies, it is hoped, will widen the scope of identifying pupils’ learning difficulties in the Standard 6 program. Through use of the Rasch approach, the results will provide more precise and focused definition of the state of the quality of primary education by providing information on the actual skills pupils and teachers have for the accomplishment of the different learning tasks. The descriptions will be of great help to specialists of mathematics and reading including teachers to guide classroom teaching

strategies, design of pre- and in-service training programmes, and the design of textbooks and teaching/learning materials.

General Policy Concern 19:

What were the levels (according to Rasch scores and descriptive levels of competence) and variations (among schools and zones) in the achievement levels of Standard 6 pupils and their teachers in Reading and mathematics – for my Tanzania and for all other SACMEQ countries?

As explained in Chapter 2, pupil achievement in both reading and mathematics has been presented in such a way that it provides a descriptive account of increasing levels of competence. The technique (Rasch approach) permits for each test the performance of pupils to be aligned along a single dimension that could be broken into groups or levels each being named according to the skills or competencies required to successfully complete the items within each group. The descriptive information reveals the tasks that pupils can manage and the knowledge and skills that they require if they are to move to the next higher level of competence. The approach is a shift from the traditional way of presenting pupil achievement which assigns scores based on the number of correct test items.

In both reading and mathematics there were 8 levels of competency. The first 3 competency levels in each subject were more mechanical and involved the most elementary competencies.

The competencies associated with each level have been presented in Chapter 2. In reading they are summarized as follows: Level 1 = Pre Reading, Level 2 = Emergent Reading, Level 3 = Basic Reading, Level 4 = Independent Reading, Level 5 = Interpretive and Inferential Reading, Level 6 = Critical Reading, Level 7 = Analytical Reading, Level 8 = Insightful Reading.

In mathematics they are summarized as follows: Level 1 = Pre Numeracy, Level 2 = Emergent Numeracy, Level 3 = Basic Numeracy, Level 4 = Beginning Numeracy, Level 5 = Competent Numeracy, Level 6 = Mathematically skilled, Level 7 = Problem Solving, Level 8 = Abstract Problem Solving. Details have been cited in the results whenever appropriate.

What were the overall mean scores of pupils and their teachers in reading and mathematics?

Overall mean scores of pupils - a classical analysis

The results of the reading and mathematics test scores of pupils with all items have been summarized in Table 7.1.

Table 7.1. Means and sampling errors for the reading and mathematics test scores of pupils with all items

Zone	Pupil performance on all items			
	Reading		Mathematics	
	Mean	SE	Mean	SE
Central	538.2	11.77	512.4	12.08
Eastern	569.2	12.24	529.9	8.48
Kagera	539.9	9.90	513.8	7.98
Kilimanjaro	556.4	9.28	541.8	8.60
Mwanza	531.7	18.73	504.8	13.98
Northeast	551.1	12.86	516.5	9.33
Northern	557.8	15.70	549.2	14.35
Southern Highlands	564.8	16.78	530.9	13.42
Southern	495.8	13.56	486.9	8.80
Southwest	527.9	13.55	510.2	15.07
Western	530.3	17.64	513.3	16.46
Tanzania	545.9	5.03	522.4	4.20

Note: The pooled SACMEQ II reading and mathematics test scores for all countries were transformed to a mean of 500 and a standard deviation of 100.

In the second column of Table 7.1 it can be seen that the national mean score in reading was 545.9. The national mean score in mathematics was 522.4 (Column 3). The variations in mean scores among the zones were considerable for both subjects. Mean scores in reading ranged from a high of 569.2 in the Eastern Zone (Dar es Salaam and Pwani regions) to a low

of 495.8 in the Southern Zone (Ruvuma, Lindi and Mtwara regions). Other zones with low performances in reading were the Southwest and Western Zone.

In mathematics, variations were from a high mean score of 549.2 in Northern Zone (Mara, Arusha regions) to a low of 486.9 in the Southern zone. Mwanza and Southwest Zones also had low performances in mathematics. Southern Zone had the lowest mean score in both subjects.

Overall, a pattern emerged in both subjects where pupils' mean score in Southern Highlands, Northern, Eastern, and Kilimanjaro Zones tended to be high (the first 4 highs) and, by contrast, pupils from the Southern Zone performed the poorest. However, it must be pointed out that the mean scores for pupils in Tanzania overall, and for all the zones except Southern Zone, were above the SACMEQ mean of 500, and this was really commendable.

Overall mean scores of teachers - a classical analysis

The performance of teachers in both reading and mathematics has been presented in Table 7.2.

Table 7.2. Means and sampling errors for the reading and mathematics test scores of teachers

Zone	Teacher performance on all items			
	Reading		Mathematics	
	Mean	SE	Mean	SE
Central	714.9	9.19	806.6	17.891
Eastern	699.6	9.24	787.1	22.95
Kagera	725.9	9.93	800.6	16.74
Kilimanjaro	697.2	17.39	811.8	15.54
Mwanza	698.8	10.10	766.6	44.96
Northeast	708.6	14.26	804.1	25.03
Northern	707.2	8.61	789.3	18.68
Southern Highlands	709.6	8.21	823.1	14.49
Southern	712.0	18.73	746.5	24.88
Southwest	701.8	11.66	799.7	23.51
Western	704.8	7.65	785.2	31.45
Tanzania	706.7	3.37	794.3	7.54

Note: The pooled SACMEQ II reading and mathematics test scores for all countries were transformed to a mean of 500 and a standard deviation of 100.

It is noted that Standard 6 pupils in Tanzania were taught by teachers whose mean scores were 794.3 in mathematics and 706.7 in reading. There were no major variations among the zones in teachers' performance in reading. The variations ranged from a high mean score of 725.9 in Kagera to a low mean score of 697.2 in Kilimanjaro. In mathematics, however, the variations among the zones were significant ranging from a high performance mean of 823.1 in Southern Highlands to a low of 746.5 in the Southern Zone. It is important to exercise caution when interpreting the results due to the very large standard errors of sampling associated with some of the figures especially in Mwanza and Western Zone. From the results, it can be inferred that Standard 6 pupils were taught by mathematics teachers whose difference in competencies in the subject were much greater (76.6 points gap) than the difference in competencies of their reading teachers (28.7 points gap). In addition, these results when compared with those of pupils' performance summarized in Table 7.2 indicate

that generally the performance of teachers in each of the two subjects was much higher than that of pupils.

What were the overall percentages of pupils and their teachers across the various levels of competence in reading and mathematics?

It is noteworthy that, as stated earlier, eight levels of increasing competence were identified. The levels were defined according to what type of skills and competencies were required by the pupil to get the item right at each level. That is a respondent reaching a certain level had an even chance of getting the items right at the level. He/she also had the competencies to get right all the items in the levels lower than the level he/she had reached but he/she did not have a chance of getting items right at the higher levels .

In Table 7.3 (a) the percentages and sampling errors for literacy levels of pupils have been presented.

Table 7.3 (a). Percentages and sampling errors for literacy levels of pupils

Zone	Percentage of pupils reaching the Reading competence level															
	1		2		3		4		5		6		7		8	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Central	2.3	1.18	5.3	1.96	12.9	3.23	17.3	2.91	24.2	2.76	21.7	3.27	14.6	3.07	1.8	0.87
Eastern	0.9	0.63	3.7	1.45	3.9	1.42	16.6	3.78	25.7	3.70	19.4	3.45	23.3	4.97	6.5	2.46
Kagera	2.3	1.38	5.0	2.21	9.3	2.00	22.6	2.60	22.4	2.94	19.5	2.99	17.6	2.60	1.3	0.69
Kilimanjaro	0.0	0.00	2.5	0.85	6.2	2.13	23.0	3.17	24.4	2.76	24.8	2.89	15.5	3.57	3.5	1.20
Mwanza	2.1	0.90	5.6	3.20	11.6	3.77	26.5	3.10	20.1	3.15	18.8	4.44	13.9	4.12	1.6	1.41
Northeast	1.9	1.54	5.2	3.02	6.8	2.07	18.0	3.22	21.7	3.64	23.9	3.61	22.0	4.28	0.5	0.46
Northern	2.2	1.06	4.8	1.38	10.5	2.73	15.6	2.79	19.0	2.23	20.9	3.35	23.3	5.53	3.6	1.54
Southern Highlands	1.7	0.70	3.8	1.59	7.4	2.91	13.5	3.22	22.1	2.97	23.8	3.11	24.5	6.36	3.1	1.32
Southern	8.0	2.41	9.6	2.07	16.1	4.69	30.5	6.05	15.5	1.74	11.0	4.52	9.4	3.98	0.0	0.00
Southwest	3.8	1.53	8.2	2.84	11.3	3.11	19.6	3.25	24.9	3.24	15.1	2.53	14.7	3.95	2.3	1.28
Western	7.2	1.98	8.7	2.75	10.1	2.96	17.2	2.84	17.8	3.23	20.5	3.43	15.3	3.48	3.2	1.75
Tanzania	2.8	0.41	5.5	0.66	9.4	0.94	18.9	1.14	21.4	0.95	20.6	1.13	18.8	1.62	2.7	0.46

It can be seen from Table 7.2 that the reading competences of Standard 6 pupils were spread across all 8 competence levels with the modal reading competence level as Level 5 (interpretive reading). There were 21.4 percent of Standard 6 pupils reaching this level. That is, pupils reaching this level mastered “reading back and forth in order to combine and interpret information from various parts of the text in association with external information (based on recalled factual knowledge) that “completes” and contextualizes meaning.”

About the same numbers of pupils as those located in Level 5 reached Levels 4, 6 and 7. Relatively fewer Standard 6 pupils fell in each of the Levels 1, 2, and 8. Taking the modal level as the cut off point, it can be said that there were 36.6 percent of pupils (those located in Levels 1 through 4) who did not master the competencies or skills at level 5 and indeed at each of the higher Levels 6 through 8. In other words, 36.6 percent (100%-63.5%) of Standard 6 pupils had only competence levels of between Level 1 and 4. Standard 6 pupils reaching Level 5 up to Level 8, were 63.5 percent (21.4% + 20.6% + 18.8% + 2.7%) altogether.

There were considerable variations among the zones. Kilimanjaro Zone was the only zone which had no pupils (0.0%) in level one (pre-reading) whereas Southern and Western zones had the largest percentages of pupils in the pre-reading level of 8.0 and 7.2 percent respectively. That is, after spending 6 years of primary education, the competence of pupils in the zones was only that of “locating familiar words in short text, matching words to pictures, use letters to identify words and were only able to follow short and familiar instructions.”

Further analysis (through summing up percentages of pupils reaching reading Levels 5 up to 8) revealed that Eastern Zone, which is largely urban, had the highest percentage of pupils of 74.9 percent reaching the range of levels. It is disappointing to note that the Southern Zone had the lowest percentage of pupils in the range (35.9%). Other zones which had low percentages of pupils in the range were Mwanza (54.4%), Western (56.8 %) and Southwest Zone (57.0 %). In the Southern Zone there were no pupils (0.0%) reaching Level 8 unlike in the rest of the zones.

If we take Level 3 (basic reading) to define the level where a pupil has acquired literacy, then we may conclude that 8.3 percent of Tanzania's Standard 6 pupils were illiterate. This figure is not very high, it being less than a tenth of all pupils. The highest levels of illiteracy were in Western Zone (15.9%), and the lowest levels were in Kilimanjaro (2.5%).

This may require carrying out an item analysis to identify the various areas and types of weaknesses manifested by pupils after answering the items. In turn this could provide a basis for re-examining teaching materials provided for teaching, their suitability and the abilities of teachers to teach the skills and competencies in question, especially in the zones where relatively large proportions of pupils did not reach Level 5. Further examination could be made in the area of teacher training to establish whether the pre-service programmes adequately prepared teachers in the competencies in question. At the in-service level, teacher training programs will need to be designed in order to address the areas of weakness. The use of Education Cluster Centres (E.C.C.) could be among the most effective and sustainable mechanism to reach out all the targeted teachers nationwide. School inspectors will also need to be re-oriented in the areas in question so that they monitor and support teachers' classroom teaching with emphasis on the skills in question.

Pupils reaching mathematics competence level

The percentages of pupils reaching Mathematics competence level have been presented in Table 7.3 (b).

Table 7.3 (b) Percentages and sampling errors for numeracy levels of pupils

Zone	Percentage of pupils reaching the mathematics competence level															
	1		2		3		4		5		6		7		8	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Central	4.1	1.95	23.9	4.37	32.3	3.24	26.4	3.91	7.9	1.90	4.0	1.68	1.4	1.00	0.0	0.00
Eastern	0.3	0.31	17.1	2.97	38.3	4.90	25.1	2.69	12.1	3.31	6.3	2.34	0.7	0.49	0.0	0.00
Kagera	2.7	1.39	21.9	2.51	43.8	2.61	19.0	3.38	7.5	1.92	3.5	1.69	1.1	0.61	0.5	0.50
Kilimanjaro	0.5	0.52	15.9	4.05	31.8	3.86	30.3	2.29	12.9	3.60	7.1	2.27	0.9	0.62	0.5	0.52
Mwanza	5.0	1.85	26.8	3.71	37.9	5.59	15.9	3.68	8.4	3.37	4.5	1.62	1.5	0.84	0.0	0.00
Northeast	2.2	1.58	27.6	3.77	32.8	4.19	22.1	2.92	9.2	2.34	4.3	1.58	1.2	0.67	0.5	0.47
Northern	1.4	0.72	17.3	4.11	29.7	4.52	24.1	3.06	12.4	2.69	10.8	3.81	3.0	1.56	1.2	0.60
Southern Highlands	1.7	0.70	17.9	3.13	40.6	3.79	19.7	2.72	11.0	3.14	6.7	2.11	2.3	1.62	0.0	0.00
Southern	4.4	1.04	37.1	4.48	35.7	6.91	13.1	3.32	4.5	2.12	4.8	3.31	0.4	0.45	0.0	0.00
Southwest	4.8	2.15	23.9	5.43	37.5	3.41	20.1	4.59	7.6	3.01	5.1	2.06	0.8	0.57	0.2	0.22
Western	5.7	2.26	28.3	5.20	29.6	3.93	17.8	3.92	10.0	2.35	5.7	1.73	2.0	1.20	0.9	0.65
Tanzania	2.8	0.43	22.7	1.32	35.0	1.35	21.4	1.05	9.9	0.90	6.2	0.80	1.6	0.39	0.4	0.12

The modal was Level 3 (Basic numeracy level) where the percentage of Standard 6 pupils reaching the level was 35 percent. Around one quarter of Standard 6 pupils reached the first and the second levels, and it can be concluded that these were still not numerate. There were 21.4 percent of the pupils who reached Level 4 and much smaller percentages of pupils reaching each of the subsequent and more complex levels (between 9.9% at Level 5 and 0.4 % at Level 8).

Large variations were noted among the zones in the percentages of pupils reaching each of the competence levels. Disappointingly, all zones had some Standard 6 pupils whose numeracy competence was only at Level 1, which is the least complex level (pre numeracy level). Western Zone had the largest percentage of pupils (5.7 percent) who could only reach the least complex, Level 1.

In three zones, namely Mwanza, Northeast, and Western, alarmingly large percentages of around 30 percent of Standard 6 pupils reached only levels 1 and 2, and were therefore not numerate. Around 41 percent of the pupils in Southern Zone had not reached basic numeracy. None of the Standard 6 pupils reached the most complex level that is Level 8 in five zones, namely Southern, Southern Highlands, Central, Eastern and Mwanza. Northern

Zone had the largest percentage of pupils (1.2%) reaching level 8. However, the low figures for the level and to a lesser extent Level 7 would be expected since competencies and skills tested in the levels were meant mainly for teachers.

Further examination of the results show that Northern, Kilimanjaro, Southern Highlands, and Eastern Zones had the largest percentages of pupils reaching the four highest levels that require mastery of the more complex skills (Levels 5, 6, 7 and 8), with percentages of pupils reaching these levels being 27.4 percent, 21.4 percent, 20.0 percent and 19.1 percent respectively.

It is clear from the results that the mathematics competence levels of Standard 6 pupils were less encouraging than those for reading, although a direct comparison between the two subjects is not possible. The majority of Standard 6 pupils could not master the more complex competencies in mathematics and variations in pupils' competence levels among zones were wide and deserve urgent attention. An investigation was warranted examining the strategies used in the teaching and learning of mathematics, especially in the poorly performing zones.

Policy suggestion 7.1. The Institute of Education in collaboration with the Inspectorate Department should investigate on the strategies used in the teaching and learning of reading and mathematics, especially in the poorly performing zones.

The results of levels of competence of Standard 6 pupils in both reading and mathematics require a rigorous investigation to the way reading and mathematics were taught.

This may require carrying out an item analysis to identify the various areas and types of weaknesses manifested by pupils after answering the items. In turn this could provide a basis for re-examining teaching materials provided for teaching, their suitability and the abilities of teachers to teach the skills and competencies in question, especially in the zones where relatively large proportions of pupils did not reach Level 3, especially in mathematics.

Further examination could be made in the area of teacher training to establish whether the pre-service programmes adequately prepared teachers in the competencies in question. At the in-service level, teachers' programs will need to be designed in order to address the areas of weakness. The use of education cluster centres could be the most effective and sustainable mechanism to reach out all the targeted teachers nationwide.

Policy suggestion 7.2. The Teacher Training Department should review its pre-service and in-service programmes, including its general teacher training curriculum, in order to ensure that content of the assessment techniques include item response theory.

School inspectors will also need to be re-oriented in the areas in question so that they monitor and support teachers' classroom teaching with emphasis on the item response theory and skills in question.

Policy suggestion 7.3. The Inspectorate Department should organize training for inspectors in assessment techniques using the item response theory so that they can effectively support and improve teachers' skills in assessing learners in key competencies.

What were the overall percentages of pupils and their teachers across the various levels of competence in reading and mathematics?

Teachers are supposed to be well ahead of their pupils in terms of the subject matter of the taught curriculum because, among other things, their academic levels are higher than the levels of their pupils. It is expected that teachers will largely be located in the highest competence levels (Levels 7 and 8) as these are the levels where one has to have mastery of complex literacy and mathematics skills in order to get test items right at each of these levels. The percentages of teachers reaching the different levels of literacy and numeracy competence have been presented in Table 7.4 (a) and (b).

Teachers reaching reading competence level

The percentages of teachers reaching the literacy competence levels have been presented in Table 7.4 (a).

Table 7.4 (a). Percentages and sampling errors for literacy levels of teachers

Zone	Percentage of teachers reaching the Reading competence level															
	1		2		3		4		5		6		7		8	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Central	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	45.9	12.92	54.1	12.92
Eastern	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	69.8	9.57	30.2	9.57
Kagera	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	40.4	13.25	59.6	13.25
Kilimanjaro	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	12.7	8.75	42.8	13.73	44.4	13.60
Mwanza	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	6.7	6.76	44.8	15.63	48.5	16.24
Northeast	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	63.8	13.84	36.2	13.84
Northern	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	4.7	4.71	47.5	11.01	47.8	11.07
Southern Highlands	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	2.9	2.93	46.0	14.34	51.1	14.09
Southern	0.0	0.00	0.0	0.00	0.0	0.00	2.6	2.63	0.0	0.00	0.0	0.00	44.5	18.36	53.0	18.53
Southwest	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	59.8	14.01	40.2	14.01
Western	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	54.4	12.05	45.6	12.05
Tanzania	0.0	0.00	0.0	0.00	0.0	0.00	0.2	0.18	0.0	0.00	2.6	1.18	51.1	4.15	46.1	4.15

In Table 7.4 (a) it can be seen that most of Standard 6 reading teachers reached the highest three levels of competence. There were 2.6 percent of them who reached Level 6 while 51.1 percent reached Level 7 and 46.1 percent reached Level 8.

The lowest competence level of reading teachers was Level 4 where 0.2 percent of them were located. We can therefore conclude that all teachers had reached basic literacy and this, of course, was expected.

There were some variations among the zones in the percentage of teachers reaching the Reading competence level. Teachers in the Southern Zone alone had competencies as low as Level 4, with 2.6 percent of them reaching this level. More than half of the teachers in four other zones reached level 8 (most complex level). The zones were Kagera with 59.6 percent, Central with 54.1 percent, Southern with 53.0 percent and Southern Highlands with 51.1 percent.

It is clear from the results that the majority of the reading teachers had competencies and skills in the more complex levels (Levels 6-8). However, there were wide disparities across

the zones in the percentages of teachers reaching each of the levels; as a result pupils in some zones were more disadvantaged than others by having smaller numbers of more competent teachers.

The competence of teachers did not, most of the time, correlate with the performance of their pupils (summarized in Table 7.3(a)). For instance, Southern Highlands zone which had 51.1 percent of the teachers who reached level 8, had the second highest percentage of pupils reaching levels 5-8 of 73.5 percent. By contrast, Southern zone had the least percentage of pupils of 35.9 percent reaching levels 5-8, yet 53.0 percent of its teachers (a bit more than in the Southern Highlands) reached level 8. Furthermore, the zone had the smallest percentage of pupils reaching Levels 5 through 8 among the zones. These figures did not portray a good picture and warrants further investigation into the learning and teaching of reading in the zones.

What were the overall percentages of teachers across the various levels of competence in mathematics?

The percentages of teachers reaching the numeracy competence levels have been presented in Table 7.4(b).

Table 7.4 (b) Percentages and sampling errors for numeracy levels of teachers

Zone	Percentage of teachers reaching the mathematics competence level															
	1		2		3		4		5		6		7		8	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Central	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	66.6	14.93	33.4	14.93
Eastern	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	8.3	8.30	17.0	9.35	28.0	12.16	46.8	14.56
Kagera	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	6.5	6.52	41.3	13.34	52.1	13.49
Kilimanjaro	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	7.6	7.65	34.4	13.23	58.0	13.90
Mwanza	0.0	0.00	0.0	0.00	0.0	0.00	17.3	17.30	0.0	0.00	6.5	6.64	46.3	15.76	29.9	13.69
Northeast	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	16.2	10.50	36.1	14.65	47.7	14.52
Northern	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	7.1	5.22	15.5	9.77	31.9	10.95	45.4	12.10
Southern Highlands	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	3.5	3.61	32.9	9.01	63.6	9.29
Southern	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	11.5	11.76	1.8	1.88	80.9	13.13	5.8	6.00
Southwest	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	15.0	15.10	45.9	16.08	39.1	15.69
Western	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	45.2	13.00	15.9	8.90	38.9	13.36
Tanzania	0.0	0.00	0.0	0.00	0.0	0.00	1.5	1.52	2.7	1.37	13.2	2.75	38.8	3.91	43.9	4.08

All Standard 6 mathematics teachers reached the level of basic numeracy, that is, level 3 of competence. Some 13.2 percent of them reached Level 6 while 38.8 percent reached Level 7 and 43.9 percent reached Level 8. The lowest competence level reached by mathematics teachers was Level 4. There were 1.5 percent of them reaching the level nationally. This was also the lowest competence level reached by reading teachers, although the percentage of reading teachers was about 7 times smaller.

Variations were noted among the zones, with some of the zones reflecting some disturbing results. In Mwanza zone 17.3 percent of mathematics teachers reached only Level 4 whereas 7.1 percent of the teachers from the Northern, 8.3 percent from the Eastern zone, and 11.5 percent from the Southern zone reached only Level 5. It should be noted though that the standard errors (SE) associated with these figures were big. The results suggest the need for further research into the quality of mathematics teachers in these zones.

Southern Highlands Zone had the largest percentage of teachers reaching the highest competence level (Level 8) of mathematics of 63.6 percent followed by Kilimanjaro, which had 58.0 percent, and Kagera, which had 52.1 percent. On the other hand, Southern and

Mwanza registered the smallest percentage of teachers reaching Level 8 (5.8 % and 29.9 % respectively).

The competence levels of mathematics teachers revealed no strong correlation with the achievement levels in mathematics of Standard 6 pupils (summarized in Table 7.3 (b)) except in Kilimanjaro, Mwanza and Southern Zones. For instance, in the Eastern zone no pupil reached Level 8 although 46.8 percent of its teachers reached this level. In Southern Highlands no pupils reached Level 8 yet they had the largest percentage of teachers (63.6%) reaching this level. No pupils reached Level 8 in five other zones.

Overall, the results appear to underline that teachers' competence was a necessary but not sufficient condition to guarantee pupils' success. The results of competence levels of mathematics teachers for Southern and Mwanza Zones could partly and most probably explain why pupils could not master a range of skills and competencies in their Standard 6 program, rendering them disadvantaged. Mathematics teachers in the zones, in turn, were also disadvantaged because their relatively low levels of competence could possibly be a constraining factor with regard to their effective coverage of some of the more challenging content in the Standard 6 program.

It is clear from the results of pupils and mathematics teachers that further examination of teachers' characteristics and classroom conditions is necessary. Teachers' teaching conditions, pedagogical practices, and teaching/learning materials should be examined. An item analysis of the test blueprints by panels of examination officials, school inspectors of reading, curriculum developers, teacher trainers and teachers is necessary in order to establish the skills areas which need to be strengthened among teachers in order to ensure the achievement of key curriculum objectives. The exercise could be carried out simultaneously with a similar exercise for pupils.

Policy suggestion 7.4(a). The Ministry should establish a taskforce consisting of curriculum developers, inspectors and experienced teachers and tutors to establish the skills areas which need to be strengthened among teachers in order to ensure the achievement of key curriculum objectives.

Policy suggestion 7.4(b). The Tanzania Institute of Education and the inspectorate should re-examine teaching materials provided for teaching, their suitability and adequacy and the teaching skills of teachers especially in the zones where relatively large proportions of pupils and teachers did not reach the cut off literacy and numeracy competence levels.

What were the overall percentages of pupils and their teachers across the various levels of mastery in reading?

What were the overall percentages of pupils across the various levels of mastery in reading?

The percentages of pupils reaching the levels of mastery in reading have been presented in Table 7.5 (a).

Table 7.5(a). Percentages and sampling errors of pupils reaching minimum and desirable reading levels of mastery.

Zone	Pupils reaching minimum level of mastery		Pupils reaching desirable level of mastery	
	%	SE	%	SE
Central	67.6	5.95	22.0	4.09
Eastern	78.3	5.04	34.1	5.52
Kagera	66.8	4.53	21.4	3.14
Kilimanjaro	75.7	3.75	24.6	5.07
Mwanza	59.1	10.75	18.5	5.65
Northeast	71.0	5.96	29.5	5.15
Northern	70.3	6.21	34.0	7.13
Southern Highlands	77.5	6.44	34.3	8.39
Southern	44.4	6.74	12.7	5.26
Southwest	61.2	6.80	21.6	4.62
Western	59.7	8.17	25.5	5.71
<i>Tanzania</i>	67.9	2.24	27.1	2.14

In column 2 of Table 7.5 (a) it can be seen that in Tanzania 67.9 percent of Standard 6 pupils reached the minimum level of mastery in reading and 27.1 percent reached the desirable levels. On the basis of these results, it was possible to infer the following for the total population of Standard 6 pupils in Tanzania:

- (a) The proportion of Standard 6 pupils in Tanzania who reached the minimum level of mastery of the reading test was (with 95 percent confidence) $67.9 \pm 2(2.24)$ percent. In other words, the percentage of pupils who reached the minimum level of mastery was located between 63.42 percent and 72.38 percent.
- (b) The proportion of Standard 6 pupils in Tanzania who reached the desirable was $27.1 \pm 2(2.14)$, that is, the percentage of pupils was located between 22.82 percent and 31.38 percent.

On the basis of the above figures, it was also possible to infer for the total Standard 6 population in Tanzania during 2000, the percentage of pupils which did not reach the minimum and desirable levels. Given that the size of the target population, it is also possible to calculate the exact numbers of pupils who reached or failed to reach either level.

There were notable variations among the zones, with the minimum level of mastery for the Eastern Zone standing at 78.3 percent of pupils reaching the level compared to a low percentage of 44.4 percent of pupils in the Southern Zone who reached this level.

The percentage of pupils reaching the desirable level ranged from highs of 34.3 percent in Southern Highlands followed closely by the Eastern Zone with 34.1 percent to a low of 12.7 percent in the Southern Zone. Among the many reasons that could probably explain the particularly low performance of pupils in the Southern Zone is inadequate teaching learning materials and teachers with inadequate competence (academic and professional). For many years, the rural and remote nature of many parts of the zone were characterised by a poor transport system which did not attract competent teachers especially those who originated from other parts of the country. This state also interfered with the smooth distribution of material inputs from the district education offices, regional offices or the ministry headquarters to schools. The other could be the low socio-economic status of pupils' homes which could presumably not provide the requisite educational support to children. In Tanzania the rural areas are, in most cases, associated with low socio-economic status of homes. The converse explanation would explain why Eastern Zone (largely urban) did much better than the rest.

What were the overall percentages of teachers across the various levels of mastery in reading?

The percentages of teachers reaching the levels of mastery in reading have been presented in Table 7.5 (a).

Table 7.6. Percentages and sampling errors of teachers reaching minimum and desirable levels of mastery in reading.

Zone	Teachers reaching minimum level of mastery		Teachers reaching desirable level of mastery	
	%	SE	%	SE
Central	100.0	0.00	100.0	0.00
Eastern	100.0	0.00	100.0	0.00
Kagera	100.0	0.00	100.0	0.00
Kilimanjaro	100.0	0.00	87.3	8.75
Mwanza	100.0	0.00	100.0	0.00
Northeast	100.0	0.00	100.0	0.00
Northern	100.0	0.00	95.3	4.71
Southern Highlands	100.0	0.00	97.1	2.93
Southern	97.4	2.63	97.4	2.63
Southwest	100.0	0.00	100.0	0.00
Western	100.0	0.00	100.0	0.00
Tanzania	99.8	0.18	97.8	1.06

It is worth noting that there were no essential items specified for teachers therefore these were assessed against the benchmarks of pupils' minimum and desirable items. The expectation was that 100 percent of the teachers would exceed the two levels.

It can be seen that for the nation almost all Standard 6 teachers (99.8%) reached the minimum level of mastery, with 100 percent of them reaching the level in all zones except in the Southern Zone where the percentage of teachers reaching the level was 97.4 percent.

Those reaching the desirable level were 97.8 percent. There were some variations among the zones where the lowest percentage was in Kilimanjaro (87.3%). However it is important to note that the standard error of sampling was large for Kilimanjaro. Altogether, 6 zones had all of its teachers reaching the desirable level. The relatively low percentage of teachers in the Southern Zone reaching the minimum and desirable levels related well with low

performance of pupils in the overall performance. The trend was not repeated for Kilimanjaro since pupils' performance was among the high achieving zones at both levels.

Policy suggestion 7.5. The Inspectorate should investigate further on the causes of low performances in reading by pupils particularly in the Southern, Mwanza and Central zones and by teachers particularly in Kilimanjaro, Northern and Southern Highlands Zones.

General Policy Concern 20:

What were the reading and mathematics achievement levels of important sub-groups of Grade 6 pupils and their teachers (for example, pupils and teachers of different genders, socio-economic levels, and locations)?

Equalizing learning opportunities can be undermined if there is no knowledge about the achievement levels of pupils of different subgroups and the underlying factors within their contexts which have an impact on their learning. It is common that schools in the rural areas with poor infrastructure may be disadvantaged because they cannot attract and retain the most competent and committed teachers, and they experience problems with regard to securing enough classroom supplies from the centre or the district office. Teaching methods can undermine the learning achievement of the female pupils if they are biased in favour of the male pupils. The wealthier families are likely to have homes that are more conducive for pupils to do their homework and capacity for the acquisition of more classroom supplies. It is important therefore to analyse the level of performance of the subgroups in order to establish the achievement differentials among them and in turn propose suggestions that would guide informed decisions on how to attain equity of learning opportunities.

Analysis of mastery levels by subgroups

The results of the performance of pupils and teachers in reading and mathematics have been presented in Tables 7.7 to 7.9 (c) by subgroup. The first subgroup is based on gender (girls and boys); the second is based on socio-economic level. It should be recalled that in Chapter 3 the socio-economic level of pupils' homes as measured against a set of 13 items as well as the amount of livestock they possessed were discussed. The third group is the location of schools, which is another variable discussed earlier on in Chapter 4.

Pupil performance on all items

In Tables 7.7 the results of the performance of pupils and teachers in reading and mathematics have been presented by subgroup using the classical approach

Table 7.7. Means and sampling errors for the reading and mathematics test scores of pupils by sub-groups

Sub-group	Pupil performance on all items			
	Reading		Mathematics	
	Mean	SE	Mean	SE
<i>Gender</i>				
Boys	554.3	5.72	539.6	5.65
Girls	538.2	5.33	506.7	3.98
<i>Socio-economic level</i>				
Low SES	528.8	4.83	509.0	3.96
High SES	575.2	6.72	545.4	6.77
<i>School location</i>				
Isolated/Rural	525.1	4.41	508.7	3.74
Small town	598.6	9.65	554.0	9.84
Large city	597.2	9.95	559.4	12.41
Tanzania	545.9	5.03	522.4	4.20

Note: The pooled SACMEQ II reading and mathematics test scores were transformed to a mean of 500 and a standard deviation of 100.

What were the gender differences in reading and mathematics achievement for pupils and teachers?

In the second row of Table 7.7 it is seen that in reading, boys had a slightly higher mean score of 554.3 than girls whose mean was 538.2. However the difference was not significant. In mathematics boys had a significantly higher performance than girls (mean score was 539.6

for boys and 506.7 for girls). From the results it can be concluded that the performance of boys in reading was slightly higher than that of girls and significantly higher than that of girls in mathematics.

What were the socioeconomic differences in reading and mathematics achievement for pupils and teachers?

In the second row of Table 7.7 it can be seen that the mean scores for pupils from the low socio-economic level (mean of 528.8 for reading and 509.0 for mathematics) were significantly lower than those for pupils from the high socio-economic level in both subjects (mean of 575.2 and 545.5 in reading and mathematics respectively). The results support the expectation that pupils from the wealthier families do better than their counterparts from less wealthy families.

What were the school location differences in reading and mathematics achievement for pupils and teachers?

The reading and mathematics scores for pupils from isolated/rural were also significant different from those of pupils from either small towns or large cities. Interestingly, the difference noted in pupils' performance in either subject between small towns and large cities was very small, with pupils in small towns performing marginally better (mean of 598.6) than pupils in large cities (mean of 597.2) and a lot better than pupils in isolated/rural schools (mean of 525.1 in reading).

In mathematics the pattern changed slightly, with pupils in large cities achieving the highest mean of 559.4 while the mean for rural pupils remained lowest (508.7). The performance of pupils in small towns and large cities was not very different, although in this case it was the mean score for pupils in large towns that was marginally better than pupils from small towns.

It can be inferred therefore that, overall, for both reading and mathematics, pupils' performance was higher in those schools located in semi urban or urban and lower in rural schools. The difference in the performance of pupils between small town and large cities in both subjects was, however, insignificant.

Pupils reaching minimum and desirable levels of mastery by subgroups

In Table 7.8 the percentages of pupils reaching the minimum and desirable reading levels of mastery by subgroup have been presented.

Table 7.8. Percentages and sampling errors of pupils reaching minimum and desirable reading levels of mastery by sub-group (SACMEQ II)

Sub-groups	Pupils reaching minimum level of mastery		Pupils reaching desirable level of mastery	
	%	SE	%	SE
<i>Gender</i>				
Boys	70.1	2.44	30.8	2.53
Girls	65.9	2.59	23.7	2.27
<i>Socio-economic level</i>				
Low SES	60.3	2.51	21.1	1.75
High SES	81.0	2.35	37.4	3.55
<i>School location</i>				
Isolated/Rural	59.0	2.31	19.4	1.61
Small town	91.7	2.41	47.4	6.62
Large city	88.9	2.98	45.3	5.60
Tanzania	67.9	2.24	27.1	2.14

What were the gender differences in reading and mathematics achievement for pupils?

It can be seen in the first two rows of Table 7.8 that the percentage of girls reaching the minimum level and desirable level of mastery in reading was lower than that of boys. The difference, however, was not significant for both levels. Nevertheless, it was 7.1 percent points or almost twice as big at the desirable level compared to a difference of 4.2 percent points in the minimum level of mastery.

What were the socioeconomic differences in reading and mathematics achievement for pupils?

From Table 7.8, it can also be seen that the percentage of pupils in the low socio-economic level that reached the minimum and the desirable levels was significantly lower (60.3% and 21.1% respectively) than the percentage of pupils in the high socio-economic level who reached the two levels (81.0% and 37.4% respectively).

It is clear from the results that there was a direct relationship between the socio-economic status of pupils' families and the levels of achievement, with larger percentages of pupils from families with high socio-economic status reaching both the minimum and desirable level of mastery than their counterparts from families with low economic status.

What were the school location differences in reading and mathematics achievement for pupils and teachers?

The results presented in the bottom three rows of Table 7.8 indicated that the largest disparity in performance was between pupils in the rural schools (isolated/rural) and urban schools (located either in a small town or large city). As expected, the percentages of pupils reaching the minimum and desirable levels in the isolated/rural location were the lowest. Although there was a difference in the performance of pupils in small towns and large cities, the difference was not significant. Nevertheless, it was also interesting to note that larger percentages of pupils from small towns reached the minimum and desirable levels than those from large cities. The results appear to suggest that pupils in the small towns and large cities were at an advantage, and thus deliberate efforts should be made by the Ministry when designing future improvement plans to enhance the learning opportunities of pupils in rural schools by preferentially improving their learning conditions

Policy suggestion 7.6. The Ministry should take deliberate efforts to enhance the learning opportunities of pupils in rural schools by exploring a formula that will preferentially improve their learning conditions.

The percentages of literacy and numeracy levels of pupils by sub groups have been presented in Table 7.9 (a) and (b)

Table 7.9 (a). Percentages and sampling errors for literacy levels of pupils by sub-groups.

Sub-groups	Percentage of pupils reaching the reading competence level															
	1		2		3		4		5		6		7		8	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
<i>Gender</i>																
Boys	2.2	0.55	5.4	0.92	8.8	1.11	17.6	1.32	20.1	1.19	20.7	1.30	21.8	1.82	3.5	0.65
Girls	3.5	0.63	5.6	0.78	9.9	1.14	20.0	1.45	22.5	1.40	20.5	1.45	16.0	1.87	2.1	0.52
<i>Socio-economic level</i>																
Low SES	3.9	0.57	7.1	0.87	12.3	1.18	20.6	1.25	21.4	1.17	18.2	1.17	14.5	1.34	1.9	0.42
High SES	1.0	0.34	2.6	0.66	4.3	0.87	15.8	1.88	21.4	1.65	24.6	1.91	26.2	2.79	4.1	0.89
<i>School location</i>																
Isolated/Rural	3.8	0.54	7.3	0.82	12.3	1.10	22.5	1.15	21.7	1.02	17.6	1.17	13.7	1.25	1.1	0.25
Small town	0.2	0.22	1.0	0.58	2.4	1.00	8.2	2.38	20.1	2.60	31.0	2.80	31.6	5.87	5.4	1.51
Large city	0.6	0.45	0.9	0.56	1.6	0.83	11.4	2.64	21.1	3.53	25.0	2.72	31.2	4.86	8.1	2.06
Tanzania	2.8	0.41	5.5	0.66	9.4	0.94	18.9	1.14	21.4	0.95	20.6	1.13	18.8	1.62	2.7	0.46

What were the gender differences in reading for pupils?

The percentage of girls whose performance fell in each of the competence Levels 1 up to 5 in reading was consistently higher than the percentage of boys whose performance fell in each of these Levels. The pattern changed for the subsequent more complex levels (levels 6, 7 and 8) with the percentages of girls reaching each level becoming lower than that of boys. However the differences were insignificant. The results show, therefore, that the overall reading competence level for boys was slightly higher than that for girls, and this pattern was consistent with results that were presented when analyzing gender subgroup using the mastery level approach. The results also show that higher percentages of girls were illiterate than boys.

What were the socioeconomic differences in reading achievement for pupils?

The percentage of pupils in each of the Levels 1 up to 4 in reading under the low socio-economic subgroup was higher than that in the high socio-economic subgroup, but the percentage of pupils in the low socio-economic subgroup reaching Level 5 was equal to that of pupils in the high socio-economic level. The pattern was reversed in the subsequent

competence levels, with significantly higher percentages of pupils in the high socio-economic level managing to reach each of the more complex levels 6, 7 and 8. Thus pupils in the high socio-economic level had significantly higher reading competence, with a lower percentage of them being illiterate, than those in the low socio-economic level. These results were, once again, similar to those presented for the same subgroups under the minimum and desirable mastery levels approach.

What were the school location differences in reading achievement for pupils?

Under the school location subgroup, variations in the percentages of pupils reaching each of the 8 reading levels were noted, and some of these variations were significant. The percentages of pupils from the isolated/rural schools who only managed to reach the lower levels of competence (that is, Levels 1 to 4) were significantly higher than the percentages of pupils from schools in either small towns or large cities. Conversely, significantly larger percentages of pupils in the small and large cities reached each of the subsequent higher levels 6 to 8. The difference in pupils from schools in small towns and in large cities reaching each of the 8 reading levels was not significant, and no clear trend was reflected.

The general pattern that emerged reading achievement for pupils was that pupils from rural schools, from low socio-economic groups, and girls tended to contribute more to the overall national averages for Levels 1 to 4, but for the subsequent levels 6, 7 and 8 the pattern changed with pupils from schools in large cities or small towns, from high socio-economic levels, and who were male contributing more to the overall national averages for the higher levels that demand more complex skills.

The results of the analyses for mathematics competence levels of Standard 6 pupils by subgroup have been summarized in Table 7.9(b).

Table 7.9 (b). Percentages and sampling errors for numeracy levels of pupils by sub-groups

Sub-groups	Percentage of pupils reaching the mathematics competence level															
	1		2		3		4		5		6		7		8	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Gender																
Boys	2.2	0.48	18.2	1.54	32.1	1.71	22.8	1.55	12.1	1.15	8.8	1.26	3.1	0.75	0.7	0.25
Girls	3.3	0.58	26.8	1.73	37.6	1.72	20.1	1.36	8.0	1.11	3.8	0.84	0.3	0.16	0.1	0.07
Socio-economic level																
Low SES	3.7	0.58	26.0	1.53	36.7	1.44	19.4	1.20	8.5	0.95	4.7	0.79	0.8	0.22	0.2	0.11
High SES	1.2	0.39	17.1	1.93	31.9	2.53	24.9	1.82	12.4	1.79	8.8	1.34	3.0	0.92	0.7	0.28
School location																
Isolated/rural	3.8	0.56	26.4	1.55	36.7	1.43	19.8	1.19	7.5	0.80	4.6	0.83	0.9	0.23	0.3	0.13
Small town	0.2	0.21	12.6	2.08	36.4	3.57	22.3	3.27	15.9	2.72	9.0	1.89	3.6	1.71	0.1	0.09
Large city	0.3	0.33	14.3	2.73	25.2	4.52	28.4	2.46	16.1	2.92	11.1	2.70	3.6	1.57	1.0	0.54
Tanzania	2.8	0.43	22.7	1.32	35.0	1.35	21.4	1.05	9.9	0.90	6.2	0.80	1.6	0.39	0.4	0.12

What were the gender differences in mathematics achievement for pupils?

In Table 7.9(b) it can be seen that girls displayed significantly lower competency in mathematics than boys. The percentages of girls reaching each of the three lowest competence levels were higher than those of boys but the pattern changed as the levels of competence increased in complexity (Level 4 up to 8) where the percentage of boys reaching each level became increasingly higher than that of girls. The Ministry and institutions related with curriculum design and management may wish to investigate on the whole teaching/learning process in relation to the girl child.

Policy suggestion 7.7. The Tanzania Institute of Education in collaboration with the Inspectorate and the National Examination Council of Tanzania, should investigate why girls' mastery of higher level competencies in reading and mathematics was lower than that of boys and determine the extent to which curriculum content, school organisation and pedagogical practice are sensitive to the learning needs of girls, and thereafter take appropriate steps to ensure that girls' and boys' opportunity to learn in reading and mathematics is gradually equalised..

What were the socioeconomic differences in mathematics achievement for pupils?

A pattern emerged where larger percentages of pupils from the low socio- economic group reached each of the three lowest competence levels than the percentage of those in the high socio-economic level. The reverse was true for each of subsequent more complex levels. There were significant differences between the two subcategories for Levels 4, 6 and 7. If Level 5 was considered as the cut off point, a total of 85.8 percent of pupils in the low socio-economic level could not reach this level (that is, the sum of the percentages of those reaching only each of the first four levels) while 75.1 percent from the high socio- economic level could not reach this level. These figures indicate that there were 10.7 percent more pupils in the low socio-economic level failing to reach Level 5 and the subsequent higher levels than were those in the high socio-economic level who failed to reach Level 5. It is worth noting that this trend was more or less replicated in the results for reading summarized in Table 7.9 (a).

What were the school location differences in mathematics achievement for pupils?

The results presented by school location subgroup shows a difference between the competences of pupils in schools located in rural or isolated areas and those located in either a small town or large city. Larger percentages of pupils in isolated/rural schools only reached mathematics competence Levels 1 through 3 compared to the percentages of pupils in the other two categories who reached the levels. The percentage of pupils in the rural who reached Level 3 was equal to the percentage of pupils in small towns who reached the same level. However lower percentages of the pupils in isolated/rural location were in the subsequent higher levels which required mastery of more complex skills. Larger percentages of pupils from small towns or large cities reached the higher levels of competence in numeracy than the percentage of pupils in small towns who reached the levels except at the two highest levels 7 and 8 where the percentage of pupils in the isolated/rural location was slightly higher than that of pupils from small towns but smaller than that of pupils from the large cities.

Generally, much smaller but not significant differences were observed between pupils in small towns and those in large cities. As was the case for reading, the pattern that emerged was that pupils of the rural and low socio-economic background, and who were girls, tended

to contribute more to the overall national percentage averages reaching the lowest three levels, Levels 1-3. On the other hand, pupils in large cities, small towns and high socio-economic levels, and who were male, contributed more to the overall national averages in the subsequent, more complex levels, Levels 6 up to 8.

The results that girls' competence in mathematics and in reading are lower than that for boys, are consistent with the findings of a national analysis of Primary School Leaving Examination results for the period between 1993-1997 where the performance of girls was lower than that of boys. This trend is very worrying and deserves attention as articulated earlier on in policy suggestion 7.7.

Policy suggestion 7.8. The Ministry of Education and Culture in collaboration with Presidents Office Regional Administration and Local Government should ensure that material supplies and qualified teachers are deployed to the rural/isolated schools in order to mitigate the learning constraints faced by pupils in these areas, and thus gradually enhance their opportunity to learn.

A comparison of the competency levels between pupils and teachers

A comparison of the competence levels between pupils and teachers indicated that the lowest competence levels for mathematics and reading teachers was Level 4 (with 0.2% of reading teachers and 1.5% of mathematics teachers respectively reaching the level) while the lowest competence levels for pupils in both mathematics and reading was level 1. There were 18.9 percent of pupils in reading and 21.4 percent in mathematics who reached only competence Level 4 (the lowest competence level for teachers). On the other hand, there were 46.1 percent of reading teachers who reached Level 8 compared to 2.7 percent of pupils reaching the same level and 43.9 percent of mathematics teachers who reached level 8 compared to 0.4 percent of pupils reaching the same level. This pattern was expected.

In both subjects, Standard 6 pupils were taught by teachers who, overall, had much higher competencies than pupils did. Most of the teachers' competencies were at Level 7 and 8 where the total percentages reaching the levels were 97.2 percent in reading and 82.7 percent in mathematics. A minority of teachers had much lower competence levels than expected. It would have been desirable that all teachers reached Level 8. However in each of the subjects

more than 50 percent of the teachers could not reach the level of competence. The percentage of teachers that reached the highest level (Level 8) in reading was 46.1 percent while in mathematics it was 43.9 percent. The results seem to suggest that more reading teachers had slightly higher mastery of competencies than mathematics teachers had. Overall, the percentage of teachers whose competence level fell below Level 7 was small, and it is this small percentage that might require highly targeted interventions in order to raise their level of competence.

Policy suggestion 7.9. Inspectors should implement a closely monitored in-service training programme for teachers particularly those whose competence level fell below Level 7. Emphasis should be on the skills that have been observed to be lacking among reading and mathematics teachers. The upcoming Education Cluster/Resource Centres at Ward level that are already in place should be used to facilitate the program,

The results have provided useful and focussed benchmarks for the competence levels of pupils and teachers in different sub groups including attendant disparities. These benchmarks need to be monitored to see how they change overtime as actions proposed in this report are implemented to improve the primary education system. Furthermore, the ongoing heavy investment by the government in primary education under PEDP and in the social sector in general will presumably impact positively on the quality of learning achievement of pupils. Thus the Ministry should establish regular mechanisms for monitoring progress in reading and mathematics levels in the primary education system.

Policy suggestion 7.10. The Ministry in collaboration with National Examination Council of Tanzania should periodically carry out a similar study for monitoring changes in the competence levels of pupils in primary schools. Such a study must take into consideration the various subcategories of pupils which include school location, zone or region, gender, and socio-economic status.

Policy suggestion 7.11. The National Examination Council of Tanzania should be asked to consider adapting the item response assessment techniques to measure mastery of skills and competencies and thus enhance its assessment and certification procedures.

Conclusion

In this chapter the achievement of pupils and their teachers has been examined using three different techniques, namely, using the mean scores, using the standards set by experts, and using competence levels.

From the mean scores of pupils in reading and mathematics, it was observed that, on the whole, Tanzania's Standard 6 pupils' performance was above the SACMEQ mean of 500. It was also observed that teachers' mean score in both subjects was substantially higher than that for pupils, and this was expected. While two-thirds of Standard 6 pupils reached the minimum level of mastery in reading, just over a quarter reached the desirable level. Virtually all teachers reached the minimum level, and a tiny percentage (less than 3%) failed to reach the desirable level of mastery in reading.

The results of both reading and mathematics tests showed that, overall, competencies of Standard 6 pupils in reading were quite good, with only 8.3 percent of them being illiterate (that is, they failed to reach Level 3). A substantially higher percentage of pupils failed to reach basic numeracy (25.5%). There were also some differences in achievement between boys and girls in mathematics and of pupils among zones, between rural and urban pupils and between pupils from the low socio economic group and high socio economic group. As expected, teachers were generally more competent than their pupils.

The results provided evidence of the effects of differentials in equality of educational opportunity among pupils in their different contexts which Chapters 3 to 6 addressed. These results present a challenge for the entire education system, but more particularly for the National Examination Council, the inspectorate, teacher trainers, curriculum developers and teachers. The essence of this challenge lies in reforming the primary school curriculum and its implementation. This involves reviewing pedagogical practice, assessment, and teacher training and teaching/learning materials. In order to ensure that such reforms are producing positive results, it is important to monitor changes in the competence levels of pupils and teachers regularly overtime.

Chapter 8

Conclusion and Agenda for Action

Introduction

In the preceding chapters, a good deal of information on the successes scored and challenges still faced by Tanzania's primary education system have been presented. It has to be acknowledged that, the Government of Tanzania has made impressive strides in opening up access to education for the majority of its citizens. However the fact that the expanded vision of the 1990 Jomtien Declaration, as re-affirmed in the Dakar 2000 goals, places emphasis on ensuring that the education offered must be of a high quality is a reminder of the challenge that still lies ahead. If quality remains low, or is perceived as being low, there is the risk that even the quantitative gains already made may be lost.

The information presented in this report highlighted several issues that require attention and action by players at different levels. The factors that impact on the performance of the entire education system are of a diverse nature, but most of them are related in a complex manner. Efforts to improve the performance of Tanzania's primary education system could begin by focusing on the individual challenges that have already been highlighted. However, the ideal situation is to present the issues generated by this study in the form of an agenda that can stimulate a policy debate. In this sense, this study provides informed guidance to a co-ordinated set of policy options that take into account the interrelated nature of the challenges faced by the education system.

Tanzania has, since 2001, embarked on an ambitious nationwide programme, called the PEDP, which aims at delivery of sustainable, universal basic education of good quality. Its main strategic priority areas are: expansion of enrolment, quality improvement including capacity building and strengthening institutional arrangements. Its implementation has addressed access issues such as compulsory enrolment of eligible children both girls and boys in standard one, teacher recruitment and deployment policy, construction of classrooms, construction of teachers' houses, sanitation facilities and enrolment of out of school children and youth. Others are related to improving the professional skills of teachers through the re-organization of pre-service and in-service teacher training and increasing teaching and learning resources such as supply of adequate textbooks and other classroom supplies. Also

covered are governance and management training at all levels including financial management and Education Management Information Systems (EMIS) and institutional responsibilities from the village to the central level.

Since the inception of the PEDP programme, there have been massive increases in the enrolment of children of school going age and learning resources in all schools. Some of PEDP achievements during 2002 are that the 7-year old children enrolled to Standard 1 increased considerably resulting in an overall rise of the Net Enrolment Rate (NER) from 77% in 2002 from an NER of 85% in 2000 while 12,868 classrooms were built (92.8%) of the projected 13,868 classrooms for 2002 and 2,228 teachers quarters built. More than 6,900 teachers underwent in service and more than 7,000 teachers were recruited to match the massive enrolment gains. Several other programs and initiatives that aim at revitalising basic education have been implemented:

The School/Education Map program supported by UNICEF, CIDA and JICA aim to establish the needs of the education services at the local level and to propose action to be taken to meet the identified needs in each of the 121 districts. Started in 1997, more than 90 districts have been school mapped and their micro plans prepared. The results have been an eye opener at the local level (regions, district, ward, village and schools) by informing their decisions on basic education plans.

The Complementary Basic Education Project (COBET) is a specially tailored program supported by UNICEF and other Agencies which aims at providing basic education to out of school children with a particular focus on the girl child. Through this program, out of school children are able to access to and complete primary education in five years instead of seven. Due to its success the project has now been adapted to the mainstream education. This has been particularly successful in complementing the mainstream education in simultaneously providing access to children of legal age of entry to primary education and absorbing overage pupils who were otherwise causing backlog.

The school feeding program supported by World Food Program (WFP) and implemented in four drought-prone regions (Arusha, Manyara, Singida and Dodoma) aims at improving the participation of pupils in education by enhancing the nutritional status of children.

The Ward Based Education Management (WABEM) is a management strategy implemented in six districts whose aim is to strengthen school management through strengthening participation and partnership between the school and the community. Its focus is on the establishment of school clusters and Education Cluster Centres (E.C.Cs.) at ward level where cooperation among schools is promoted. The strategy dates back to 1999 and aims at addressing local level educational issues. However, it needs to be consolidated for replication on a national scale as a matter of urgency in order to address the disparities such as of the school facilities and professional experience among teachers and head teachers in different schools.

The Child Friendly (CFS) initiative is a rights-based learning reform strategy implemented in 11 districts, and it started in 2000. It aims to improve the mental, physical and health and quality learning through providing a learner-friendly environment. Its objectives include the establishment of school-parent management information systems to support child learning, to develop participatory, active learning approaches and to develop school self assessment systems. Like WABEM, the initiative which was established in 2001 has the potential to address local level educational issues, and needs to be consolidated for replication on a national scale.

One of the challenges the Government of Tanzania faces is that of addressing the wide disparities that have been observed in several educational inputs across the zones and across different social subgroups of pupils. It is important, therefore, that the data generated through this study be used for purposes of targeting so that greater equity is achieved. This will require the coordination of efforts by different players within the education system and outside it.

There are several other challenges faced by the government, among them the need to address the observed variations in levels of pupils' competence in reading and in mathematics again across the zones and across different social subgroups of pupils so that they reach the more complex levels of competence. It is worrying that many of the Standard 6 pupils were under achieving, grappling with less complex levels that required recall and comprehension. Sustainable strategies to ensure that pupils' achievement was commensurate with desirable levels and teachers were several pages ahead of pupils will be required.

The government also needs to deal with the problem of negative pupil attitudes. It was observed that more than half of the head teachers reported experiencing common behavioural problems, namely, 'classroom disturbance', 'cheating', 'use of abusive language', 'skipping classes', 'vandalism', 'fights', 'theft', 'intimidation of pupils' and 'sexual harassment'. This is a serious challenge to global aspirations of the education system that of ensuring that learners are inculcated with appropriate values and attitudes for good citizenry.

The finding that Standard 6 pupils in Tanzania came from families of low socio-economic status is yet another challenge requiring appropriate policy to ensure that the status does not deny pupils equal learning opportunity.

PEDP and several other national education reform initiatives have been designed around the decentralized framework of the local government reform programme. PEDP gains (and reform initiatives) reflect the extent to which the government and other stakeholders have striven to work towards providing equal learning opportunities to pupils. Under PEDP, the task of implementing some of the policy suggestions made will have coincidentally begun somewhat, and for many the task will not have begun. In both cases it will be reasonable that suggestions are treated in their own right as emanating from research evidence and using them to level off the gaps left by PEDP.

Unfortunately PEDP, like many of the other initiatives, is predominantly donor funded, with the World Bank at the centre. This is another challenge the government faces in addition to those reflected in the research findings especially in the light of the fact that donor funding is not a panacea to the education challenges. The gains made under PEDP and other initiatives require to be sustained. Most of the suggestions are made to steer a discussion requiring the participation of a broad range of stakeholders within the government, in the school, in the local community and in other non-governmental agencies, where appropriate.

The suggestions have been presented in such a way that they serve as the starting point for the government and other players to critically review the existing policies and regulatory mechanisms and processes, where necessary, so as to support more pragmatic and sustainable plans and programs that can further the gains of PEDP. This research study becomes a valuable tool, because in it the policy suggestions that facilitate collaborative action by

players within the Ministry and with partners outside it have been presented. Efforts have been made to map out the roles of relevant stakeholders within a framework where effective interventions could be undertaken by each.

Classification of policy suggestions

In Table 8.1 a total of 60 policy suggestions made in Chapters 3 to 7 have been presented, and these were categorised in order to facilitate an intensive policy dialogue at different levels of Tanzania's education system. This presentation format facilitates decisions and action. First, they are clustered on the basis of the nature of the policy action required (consultations, reviews, data collection, policy research or investment in infrastructure or human resources). Secondly, they specify the specific units, departments or sections of the Ministry and other players that have to take a lead in the implementation of the required policy actions. Thirdly, they specify the estimated time frame (short, medium or long) for the implementation of each of the policy suggestions. Lastly, they provide an idea of the estimated cost (low, moderate or high) associated with the implementation of each policy suggestion. Presented this way, they provide a clear roadmap to the players at the different levels of implementation. Five main groups of policy suggestions, therefore, emanated from this analysis.

Group 1: Consultation with staff, community, and experts. This group contained 4 suggestions (3.3, 3.12, 3.13(b), and 4.7(a)) that required a variety of consultations and discussion with other stakeholders, for example, consultation with the Ministry of Health and local communities on the improvement of school hygiene, and encouragement of parents and guardians to provide children with assistance with homework etc.

Group 2: Reviews of existing planning and policy procedures. This group contained 24 suggestions (3.4, 3.5, 3.6, 3.7, 3.8, 4.1(a), 4.2, 4.4(a), 4.7(b), 4.9, 5.1(a), 5.1(b), 5.6, 5.7, 5.8, 5.9(a), 5.9(b), 5.10, 6.1(a), 7.2, 7.4(b), 7.6, 7.8, and 7.11) which focussed on the need to revisit and reform existing regulations and practices. For example, there was a need for reviews of policy on teacher deployment to ensure a more equitable distribution of male and female teachers in schools, adapting the item response assessment techniques to measure mastery of skills and competencies of pupils.

Group 3: Data collection for planning purposes. This group consisted of 5 suggestions (3.13(a), 5.3, 5.4, 6.1(b), 6.2) which identified information gaps that could only be addressed with suitable supplementary data collections for instance carrying out a census of the buildings and toilet facilities that require major repairs or complete rebuilding, in-depth analysis of distribution of teachers among schools to redress existing inequities and an audit of the available material resources in schools for their equitable distribution.

Group 4: Education policy research projects. This group contained 15 suggestions (3.1, 3.2, 3.9, 3.11, 3.15, 3.16, 4.1(b), 4.5, 4.6, 5.2, 5.5, 7.1, 7.4(a), 7.5, and 7.7) that identified specific educational policy research projects. For example, studies to establish whether there is a genuine need for extra tuition, causes of low performances in reading by both teachers and pupils and why girls' mastery of higher level competencies in reading and mathematics was lower than that of boys have been suggested.

Group 5: Investment in human and material resources

This group contained 12 suggestions (3.10, 3.14, 4.3, 4.4(b), 4.8(a), 4.8(b), 4.8(c), 4.10, 5.9(c), 7.3, 7.9, and 7.10) which dealt with large scale national undertakings addressing educational inputs, process characteristics that would require substantial funding and a great deal of time to implement, for instance, the establishment of school libraries and the review of teachers' salaries etc.

An agenda for action by the Ministry

Investing in education is an expensive undertaking but unfortunately inevitable for meaningful economic development. The implementation of many of the 58 policy suggestions made require financing and the availability of appropriate human resource. Yet some will require more time to be implemented than others. Taken together these logistical characteristics suggest that their meaningful implementation can be done through prioritising so that the ministry could use the priorities to engage itself on the order to which it should coordinate the different tasks for effective implementation.

In this chapter time and cost in the last two columns of Table 8.1 were used to determine the priority list. They were derived through rough estimates of the resources involved for each

suggestion and where applicable against the background of what has been accomplished on the ground through PEDP and other ongoing ministry initiatives.

The following context describes the definition of the range of time and cost of estimates. With regard to the time frame, three descriptions were used, namely: 'short'- about three to nine months; 'medium'- about one to two years; 'long'- about three to five years. Similarly, three descriptions were used to refer to cost estimate factors, namely: 'low cost'- for initiatives that required no increased expenditure and could be accommodated within the existing budgets for instance through redeployment of staff, more efficient use of resources, and/or refining data collection procedures that were already in place; 'moderate cost' for activities that required data collection and/or research projects that could not be built into existing arrangements, and would therefore need to be funded in addition to the ministry operations; and 'high cost'- for large investments in capital works and human resources.

It can be seen that for most policy suggestions of a short time frame were linked to low cost while medium term ones were linked to either low or moderate cost and while long term ones were linked mostly to high cost.

On this basis, a four-stage priority listing emerged. In the first stage a list of suggestions that need to be addressed by the Ministry immediately has been given. The second stage was a list of suggestions that could be implemented after the implementation of the first stage has begun. The third stage comprises suggestions that require seeking further information as input before a consideration of priorities and the selection of a manageable subset of suggestions. The final stage requires no large scale action by the Ministry until a partnership has been established between the Ministry and a suitable development partner or donor agency.

Stage 1: For immediate action by the government. The Ministry should first concentrate on 24 policy suggestions listed under Group 1 (consultations) 3.3, 3.12, 3.13(b), and 4.7(a); Group 2 (reviews) 3.4, 3.5, 3.7, 4.1(a), 4.4(a), 4.7(b), 4.9, 5.1(a), 5.1(b), 5.6, 5.7, and 5.8; Group 4 (education policy research projects) 3.9, 3.11, 3.15, 3.16, 5.2, 7.4(a), 7.5; and 7.3 in Group 5. All these had short to medium time frames and low to moderate costs. Within the limits of logical interrelatedness, the policy suggestions which had short a time frame and low costs should be given the top priority in terms of implementation.

Stage 2: For second phase action by the Ministry. The Ministry should next act on 15 suggestions listed under Group 2 (reviews) 3.6, 4.2, 5.9(b), 5.10, 6.1(a), 7.4(b); Group 3 (data collection) 3.13(a), 5.4, 6.2; Group 4 (education policy research projects) 4.1(b), 4.5, 4.6, 5.2, and 4.4(b), and 7.9 under Group 5. These mainly had medium time frames and moderate costs. Adapting annual PEDP data collection mechanisms could help contain some costs through the simultaneous collection of data on, for instance, teacher allocation, classroom supplies, and number of classrooms available.

Stage 3: For further review before action is taken by the Ministry. These are the 13 suggestions in Groups 4 and 5 (mainly research projects) 5.5, 7.1, and 7.7, and those requiring the establishment of partnerships, namely 3.14, 4.3, 4.8(a), 4.8(b), 4.10, and 7.10. These are also associated with medium time frames and moderate to high costs. Other suggestions are 3.8 and 7.2 in Group 2 and 6.1(b), 5.3 in Group 3. The Ministry should establish those that could be undertaken as preliminary to other researches and those that could run concurrently.

Stage 4: For action by the Ministry after a ‘partnership’ has been established. Three suggestions in Group 2 namely 7.6, 7.8, and 7.11, two in Group 4 namely 3.1, 3.2 and 3.10, 5.9(c) in Group 5 had long time frames and mostly high costs. Some of the suggestions require engaging other government sectors and the use of existing operations. Exploration into the Ministry’s strategic and/or Medium Term Plans (MTEF) and joint Ministry/donor operations could be used to address the suggestions.

Table 8.1. A summary of the policy suggestions in relation to relevant actors and related time frame and cost of implementation

Policy Suggestion	Relevant Department(s)	Time	Cost
Group 1: Consultation with staff, community, and experts.			
Policy suggestion 3.3. The Ministry should liaise with the President’s Office, Regional Administration and Local Government	MOEC, PORALG, CDGC, Local Communities	Medium	Moderate

Policy Suggestion	Relevant Department(s)	Time	Cost
(PORALG) and ministry of Community Development Gender and Children (CDGC) to urgently devise mechanisms at community level to share the burden of the house hold headships by orphaned children in order to create space for the orphans to attend schools.			
Policy suggestion 3.12. The school committees and parent teacher meetings should regularly demand parent assistance with homework. A system of a checklist where the parent signs to show that she/he has assisted the child should be established to commit parent in this direction.	PORALG, Parents	Medium	Low
Policy suggestion 3.13(b). The Ministry in collaboration with PORALG should ensure that parent/teachers meetings and school committees are engaged in a dialogue with a view to committing parents to procure classroom supplies to their children that will not be procured through capitation grant.	PORALG, Parents and Local Communities	Short	Low
Policy Suggestion 4.7(a). The Inspectorate should collaborate with District Education Offices to establish stable teacher-parent liaison systems in all schools. Once established, the Ward Education Coordinators should oversee the effectiveness of the system. .	Inspectorate, PORALG, Local Communities	Medium	Low
Group 2: Reviews of existing planning and policy procedure			
Policy suggestion 3.4. The Ministry in collaboration with PORALG should explore the possibility of formulating a national strategy for sustainable school feeding programs which use locally produced foods with priority to the severely affected zones.	MOEC, PORALG Local Communities	Short	Low
Policy suggestion 3.5. The Adult education unit of the ministry should provide parents in Mwanza and Southern Zones with at least primary level of education through strengthening its adult education programs in these zones.	M OEC Adult Education Unit	Medium	Moderate
Policy suggestion 3.6. The Ministry in collaboration with the Ministry of Health (MOH) and local communities should improve school hygiene under the auspices of the School Health Education Program. Mechanisms used for making schools child friendly within the Child Friendly Schools initiative (CFS) should be explored.	MOEC, Ministry of Health, Local communities	Medium	Low/Moderate
Policy suggestion 3.7. The Ministry should liaise with the Ministry of Local Government and Regional Administration to enforce the law on compulsory attendance at community level.	MOEC, PORALG Local communities	Short	Low
Policy suggestion 3.8. The Ministry in collaboration with the Tanzania Institute	Inspectorate, Tanzania Institute of	Long	High

Policy Suggestion	Relevant Department(s)	Time	Cost
of Education should review the curriculum so that it becomes more relevant to the needs of society.	Education, Teacher Education Department.		
Policy suggestion 4.1(a). The Ministry and President's Office, Regional Administration and Local Government (PORALG) should review their teacher deployment policy in order to ensure a more equitable distribution of male and female teachers in schools.	MOEC, PORALG	Short	Low
Policy suggestion 4.2. The Ministry in collaboration with PORALG should work out scheme where teachers can easily have access to financial capital for developmental purposes that can enhance their economic status. The ongoing Saving and Credit Cooperative Societies (SACCOS) national initiative should be speedily replicated nationwide in order to facilitate teachers' access, especially rural teachers, to financial capital.	MOEC, PORALG	Medium	Moderate
Policy suggestion 4.4 (a). The Ministry should formulate a policy that requires teachers to attend a certain minimum number of in-service courses over a given period of time to ensure that every teacher keeps abreast with the changing demands of the curriculum as well as the needs of learners and society.	Inspectorate Teacher Education Department, Tanzania Institute of Education	Medium	Low
Policy suggestion 4.7(b). ADEM and Teacher Training Department should include in their management, pre-service and in-service training programs content that enhances teachers' appreciation of the importance of teacher-parent meetings, and that equips them with skills for enhancing parental participation in children's learning	ADEM Teacher Training Department	Medium	Low
Policy suggestion 4.9. PORALG should ensure that local authorities in collaboration with school committees have greater involvement in and establish mechanisms at school level for the maintenance of teachers' houses and other buildings, and ensure an adequate provision of classroom supplies so as to sustain the gains made when PEDP comes to an end in 2006.	PORALG, Local Authorities, School Committees	Short	Moderate
Policy suggestion 5.1(a). The Ministry should review its school head appointment policy in order to ensure a gender balance among primary school head teachers.	MOEC Inspectorate PORALG	short	Sort
Policy suggestion 5.1(b). The Inspectorate should investigate why there were no female head teachers in the Southern Highlands Zone and liaise with district education offices to effect corrective measures.	MOEC Inspectorate PORALG	medium	Moderate
Policy suggestion 5.6.	MOEC Inspectorate	medium	Low

Policy Suggestion	Relevant Department(s)	Time	Cost
School inspectors in collaboration with Ward education coordinators should explore mechanisms for motivating schools to institutionalize the production of school magazines and the popularisation of public speaking days and debating contests.			
Policy suggestion 5.7. The Department of School Inspection should review its mode of operation to ensure that more inspectors' time is spent on advisory functions rather than on courtesy calls.	MOEC Inspectorate	Short	Low
Policy suggestion 5.8. The Ministry in collaboration with PORALG should establish a health programme for each school where pupils are regularly examined and treated. The existing first aid system in many schools should be integrated to the programme and strengthened by ensuring that each school has at least a male and a female teacher trained in providing first aid services.	MOEC, PORALG	Short	Moderate
Policy suggestion 5.9(a). The Ministry should ensure that primary, secondary and teacher education curricula facilitate the inculcation of values and attitudes that are cherished by the communities they serve, and by Tanzania as a nation.	MOEC	Medium	Moderate
Policy suggestion 5.9(b). The Ministry should design and establish a school community/parent information system that tracks pupils' behaviour and use the information for remedial actions which include counselling.	MOEC	Medium	Moderate
Policy suggestion 5.10. The Ministry in collaboration with PORALG should ensure that the National Health Insurance fund for civil servants benefits all teachers ideally by year 2005 so that all teachers become assured of regular health checks and treatment.	Ministry, PORALG	Medium	Moderate
Policy suggestion 6.1(a). The Ministry should collaborate with PORALG with a view to deploying teachers more equitably based on the results of the analysis of existing inequities.	MOEC, PORALG	Medium	Low
Policy suggestion 7.2. The Teacher-Training Department should review its pre-service and in-service programmes, including its general teacher training curriculum, in order to ensure that content of the assessment techniques include item response theory.	MOEC Teacher Training Department	Medium	Moderate
Policy suggestion 7.4(b). The Tanzania Institute of Education and the inspectorate should re-examine teaching materials provided for teaching, their suitability and adequacy and the teaching skills of teachers especially in the zones where relatively large proportions of pupils and teachers did not reach the cut off literacy and numeracy competence levels.	MOEC Inspectorate Tanzania Institute of Education	Medium	Moderate/High

Policy Suggestion	Relevant Department(s)	Time	Cost
Policy suggestion 7.6. The Ministry should take deliberate efforts to enhance the learning opportunities of pupils in rural schools by exploring a formula that will preferentially improve their learning conditions.	MOEC	Long	Moderate/High
Policy suggestion 7.8. The Ministry of Education and Culture in collaboration with Presidents Office Regional Administration and Local Government should ensure that material supplies and qualified teachers are deployed to the rural/isolated schools in order to mitigate the learning constraints faced by pupils in these areas, and thus gradually enhance their opportunity to learn.	MOEC	Medium	Moderate
Policy suggestion 7.11. The National Examination Council of Tanzania should be asked to consider adapting the item response assessment techniques to measure mastery of skills and competencies and thus enhance its assessment and certification procedures.	MOEC	Long	High
Group 3: Data Collection for planning purpose			
Policy suggestion 3.13(a). The Ministry in collaboration with PORALG should initiate a census for all Primary Schools in order to establish the extent of supply of learning materials and classroom supplies and establish their demand. Capitation grants under PEDP should then be judiciously used to purchase the materials and supplies.	Inspectorate Policy and Planning PORALG	Short	Low
Policy suggestion 5.3. In addition to the ongoing construction of classroom buildings, toilets and teachers' quarters by the government under PEDP, MOEC in collaboration with PORALG and local communities should carry out a census of the buildings and toilet facilities that require major repairs or compete rebuilding in order to guide the on-going school reconstruction being implemented under PEDP and future ones so that more schools meet the Ministry norms for the inputs.	MOEC, PORALG	Short	Low
Policy suggestion 5.4. The Ministry and PORALG in collaboration with local communities should draw long term plans to build adequate school classrooms and other buildings. Double shift schools or multi grade teaching should be established as a temporary measure to alleviate overcrowding.	MOEC, PORALG, Local communities	Short	Low
Policy suggestion 6.1(b). The Ministry's Inspectorate department should undertake an in-depth analysis of distribution of teachers among schools in Eastern, Southern, Kagera, Mwanza, Western, Southern Highlands, Southwest and Western Zones and propose strategies for redressing the inequities.	MOEC Inspectorate	Medium	Moderate

Policy Suggestion	Relevant Department(s)	Time	Cost
<p>Policy suggestion 6.2.</p> <p>The Regional and District Education Authorities should carry out an audit of the available material resources among schools especially in the extreme zones namely: Kilimanjaro, Kagera, Eastern, Northern, and Mwanza and southern highlands and draw up a list of the extent to which they require to be supplied to schools. A formula of resource allocation that ensures a more equitable distribution of resources should be used in the future, and such a formula should take into account a prioritised set of resources needed by every school. The priorities should be used to guide the use of PEDP funds so that there is greater focus on those areas with the greatest need.</p>	Inspectorate Policy and Planning PORALG	Medium	High
Group 4: Educational policy research projects			
<p>Policy suggestion 3.1.</p> <p>The Ministry should conduct a follow up survey of the same target population employed during the first survey (SACMEQ II) in order to study changes of important educational indicators over time.</p>	MOEC	Long	High
<p>Policy suggestion 3.2.</p> <p>The Ministry in collaboration with the Ministry of Community Development, Gender and Children (MCDGC), and the Ministry of Social Work, Labor and Sports (MSWLS) should investigate the gender disparities in school enrolment and identify options that would eliminate the gender gap. In addition community-based mechanisms should be put in place in the worst-affected zones such as Kagera to provide, for instance, care to orphaned children that would relieve girls and boys of the inordinately heavy household responsibilities and thereby ensure that they attend classes regularly during school days.</p>	MOEC	Medium	Moderate/High
<p>Policy suggestion 3.9.</p> <p>The inspectorate should carry out an investigation into why repetition was high particularly in Kagera, Mwanza, Southwest, and Western Zones.</p>	Inspectorate	Short	Low
<p>Policy Suggestion 3.11.</p> <p>The Ministry should investigate on why in some zones teachers do not give homework especially in the Central and Northeast Zones in Mathematics and Southern, Southwest, Northeast, and Central Zones in Kiswahili. The Inspectorate should revisit the homework norm on the frequency of homework and on the basis of results of their investigation, devise a more corrective monitoring mechanism with the school administration and the ward education coordinators taking the lead role of ascertaining that homework was regularly given, corrected and used for continuous assessment of the pupils.</p>	Inspectorate	Short	Low
<p>Policy suggestion 3.15.</p> <p>The Ministry should investigate on whether tuition was</p>	MOEC Inspectorate	Short	Moderate

Policy Suggestion	Relevant Department(s)	Time	Cost
equitably provided as a genuine remedial measure, what made it so extensive, where it took place, how the contents and methodology used by teachers in tuition lessons compared with those employed in the normal lesson.			
Policy suggestion 3.16. The Ministry should establish whether there is a genuine need for extra tuition and, in those cases where it is necessary, regulate it so that the costs involved do not disadvantage those children who need it most. Furthermore, the Ministry must ensure that teachers do not take advantage of this practice for unfair personal gain.	MOEC Inspectorate	Short	Moderate
Policy suggestion 4.1(b). The Inspectorate in the collaboration with the Tanzania Institute of Education and Teacher Education Department should carry out a study on why female teachers do not opt to teach mathematics in primary schools and recommend corrective measures.	MOEC Inspectorate Tanzania Institute of Education Teacher Education department.	Short	Moderate
Policy suggestion 4.5. The Ministry should investigate why in-service courses in reading and mathematics were regarded as being ineffective by the majority of teachers and use the findings to review the entire in-service programme for teachers with a special focus on enhancing user friendliness and relevance. Special attention should be given to in-service courses in reading in North East Zone and the other zones where the courses were largely not found to be effective.	MOEC, Teacher Education department Tanzania Institute of Education	Medium	Moderate
Policy suggestion 4.6. School inspectors should investigate why teachers in Western and Southwest Zones in mathematics and South West, Central, Southern and Northern Zones in reading tested pupils less often.	MOEC Inspectorate PORALG	Short	Moderate
Policy suggestion 5.2. The Ministry's Inspectorate should investigate why the head teachers in Western Zone were predominantly inexperienced heads and advise the relevant District Education officials on their future appointment policy and practices so as to ensure a more equitable distribution of experienced school heads.	MOEC Inspectorate PORALG	Short	Moderate
Policy suggestion 5.5. ADEM in collaboration with the Inspectorate department, Tanzania Institute of Education should investigate how head teachers' participation in class teaching impacted on their ability to fulfil the demands of their management role and use the results to set a norm for the amount of teaching that head teachers should observe.	ADEM, Institute of Education, Inspectorate	Medium,	Moderate
Policy suggestion 7.1. The Institute of Education in collaboration with the Inspectorate Department should investigate on the strategies used in the teaching and learning of reading and mathematics, especially in the poorly performing zones.	Institute of Education, Inspectorate	Short	Moderate

Policy Suggestion	Relevant Department(s)	Time	Cost
Policy suggestion 7.4(a). The Ministry should establish a taskforce consisting of curriculum developers, inspectors and experienced teachers and tutors to establish the skills areas which need to be strengthened among teachers in order to ensure the achievement of key curriculum objectives.	MOEC	Short	Moderate
Policy suggestion 7.5. The Inspectorate should investigate further on the causes of low performances in reading by pupils particularly in the Southern, Mwanza and Central zones and by teachers particularly in Kilimanjaro, Northern and Southern Highlands Zones.	MOEC Inspectorate	Short	Moderate
Policy suggestion 7.7. The Tanzania Institute of Education in collaboration with the Inspectorate and the National Examination Council of Tanzania, should investigate why girls' mastery of higher level competencies in reading and mathematics was lower than that of boys and determine the extent to which curriculum content, school organisation and pedagogical practice are sensitive to the learning needs of girls, and thereafter take appropriate steps to ensure that girls' and boys' opportunity to learn in reading and mathematics is gradually equalised.	MOEC Inspectorate Tanzania Institute of Education National Examination Council of Tanzania	Short term	Moderate
Group 5: Investment in human and material resources			
Policy suggestion 3.10. The Ministry, in collaboration with PORALG, local authorities and the communities in Northern, Southern and Western Zones, should establish secondary schools and other basic amenities preferably at ward level, supply schools in these zones with libraries, first aid kits, in order to reduce average walking distances of pupils accessing these facilities and promote pupils' motivation and well-being.	MOEC, PORALG, Communities	Long	High
Policy suggestion 3.14. The Ministry in collaboration with PORALG and Tanzania Library Services should ensure the establishment of school libraries in all schools, initially through the thrifty use of PEDP funds, and ensure that schools formulate book borrowing policies for books in schools including those kept in libraries.	MOEC, PORALG, Tanzania Library Services	Long	High
Policy suggestion 4.3. The Ministry in collaboration with PORALG should continue its efforts to improve teachers housing conditions through building more teachers' quarters and maintaining those that are in place. Special attention should be paid to those zones where teachers housing conditions are worst.	MOEC, PORALG, Local communities	Medium	High
Policy suggestion 4.4(b). The Departments of Primary and Teacher Education of the Ministry in collaboration with PORALG should accelerate the establishment, consolidation and replication of	MOEC-Teacher Education, Primary Education, PORALG, TIE	Medium	Moderate/High

Policy Suggestion	Relevant Department(s)	Time	Cost
Education Cluster Centres under WABEM, in addition to District and Zonal Resource Centres in order to broaden teachers' access to opportunities for in-service training. Mentoring, a component of WABEM, should be developed in each cluster to provide regular teacher in-servicing at school level. Backup services should be provided to the Education Cluster Centres by District, Zonal Teacher/ Resource Centres, the Inspectorate and the Teacher Training Colleges when more specialized training is identified.			
Policy suggestion 4.8(a). The Ministry Departments of Primary Education and the Inspectorate in collaboration with TIE and PORALG should build resource centres' capacity for planning future activities that encouraged teachers' innovative skills like making teaching/learning material in addition to other important activities carried out at the centres.	MOEC Department of Primary Education, Inspectorate Department PORALG, TIE	Long	Moderate/High
Policy suggestion 4.8(b). The Department of Primary Education in collaboration with PORALG should collectively implement and consolidate the WARD based management initiative in six districts where this is being piloted, preferably within one year, and replicate this nation wide thereafter.	Department of Primary Education, PORALG	Long	Moderate
Policy suggestion 4.8(c). The Department of Teacher Education and TIE, in collaboration with PORALG should ensure the establishment of district and zonal teacher resource centres across the districts and zones in order to back up the grassroots education cluster centres under WABEM	Department of Teacher Education, TIE, PORALG	Long	High
Policy suggestion 4.10. The government in collaboration with Tanzania Teachers Union (TTU) should review teachers' salary to levels that can enable him to survive on it alone. In addition the government should design an incentive package that includes introducing hardship allowances to teachers who work in remote areas.	MOEC; PORALG, TTU	Medium/Long	High
Policy suggestion 5.9(c). The Ministry in collaboration with the Ministry of Labour and Social Works should establish external referrals to provide probationary service to juvenile delinquents where cases are on the extreme.	PORALG, MLSWS	Long	Moderate
Policy suggestion 7.3. The Inspectorate Department should organize training for inspectors in assessment techniques using the item response theory so that they can effectively support and improve teachers' skills in assessing learners in key competencies.	MOEC Inspectorate	Medium	Moderate

Policy Suggestion	Relevant Department(s)	Time	Cost
Policy suggestion 7.9. Inspectors should implement a closely monitored in-service training programme for teachers particularly those whose competence level fell below Level 7. Emphasis should be on the skills that have been observed to be lacking among reading and mathematics teachers. The upcoming Education Cluster/ Resource Centres at Ward level that are already in place should be used to facilitate the program	MOEC Inspectorate	Medium	High
Policy suggestion 7.10. The Ministry in collaboration with National Examination Council of Tanzania should periodically carry out a similar study for monitoring changes in the competence levels of pupils in primary schools. Such a study must take into consideration the various subcategories of pupils which include school location, zone or region, gender, and socio-economic status.	MOEC	Long	High

Coordination of Ministry responses to the Agenda for Action

Many players within and outside the Ministry who can make a contribution have been cited in the four-stage agenda. The Ministry will clearly need to coordinate all forms of inputs from the different players to ensure that informed decisions taken at the top senior level of the Ministry on the suggestions are implemented and that a mechanism for monitoring and evaluating the progress of the decisions is established. It is envisioned that the Office of the Chief Education Officer in the Ministry will undertake the coordination role while liaising with the research unit of the Policy and Planning Department.

The future

The SACMEQ II study took place in 1999-2000 and this publication reports the results of this study. Before the report was developed, the SACMEQ I study had been conducted and a series of coordinated research training activities involving educational planners from 15 ministries of education in the sub region had been undertaken. SACMEQ aimed at improving the capacity of educational planners in monitoring the quality of education. The educational planners from all the 15 ministries worked collaboratively in most of the steps involving the production of research instruments, designing the conduct of the survey, analyzing and interpreting the data, and finally producing an educational research report.

This research report has covered a selected set of indicators of educational achievement and general conditions of schooling and therefore leaves a lot of other data in the SACMEQ Data Archive for further analyses. From these data many more policy reports or papers can be generated.

Through the consortium of fifteen ministries of education in the sub region namely SACMEQ, Tanzania and all other members have and will continue to benefit from the collaborative strategy for developing member ministries' national capacity for monitoring and evaluating the quality of education and for the generation of data for policy development. The invaluable strategy has led the member countries to the establishment of mechanisms for monitoring and evaluating their education systems on regular basis; a phenomenon that is common in developed countries but relatively rare in Africa. Having made this major breakthrough, SACMEQ member countries need to sustain the initiative for their own benefit. Furthermore, their expertise and experiences should certainly benefit other African countries.

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Appendices

Appendix A

General Policy Concerns, Specific Research Questions, and Dummy Tables for the Design of the SACMEQ II Project

General Policy Concern 1: What were the personal characteristics (for example, age and gender) and home background characteristics (for example, parent education, regularity of meals, home language, etc.) of Grade 6 pupils that might have implications for monitoring equity, and/or that might impact upon teaching and learning?

Specific Research Questions

- What was the age distribution of pupils?
Questionnaire: SI: P2; SII: P2
Dummy Table: 3.1(a), 3.1(b)
- What was the gender distribution of pupils?
Questionnaire: SI: P3 ; SII: P3
Dummy Table: 3.1(a), 3.1(b)
- What was the level of the parents' education?
Questionnaire: SI: P9, P10; SII: P11, P12
Dummy Table: 3.1(a), 3.1(b), 11.17(a), 11.17(b)
- How regularly did pupils eat meals?
Questionnaire: SI: P18; SII: P10
Dummy Table: 3.1(a), 3.1(b)
- What percentage of pupils spoke the language of the test at home?
Questionnaire: SI: P4; SII: P4
Dummy Table: 3.2(a), 3.2(b)
- Where did pupils live during the school week?
Questionnaire: SI: P5; SII: P5
Dummy Table: 3.3(a), 3.3(b)
- How many books were there in pupils' homes?
Questionnaire: SI: P6; SII: P6
Dummy Table: 3.1(a), 3.1(b)
- What other reading materials and electronic media did pupils have at home?
Questionnaire: SI: P8.01, P8.02, P8.03, P8.04, P8.05, P8.06, P8.07 ; SII: P7.01, P7.02, P7.03, P7.04, P7.05, P07.06, P7.07
Dummy Table: 3.1(a), 3.1(b)
- What was the socio-economic status of pupils' parents in terms of possessions, housing conditions (lighting, floor, wall, roof), and livestock?
Questionnaire: SI: P8 ; SII: P7, P8, P9, P13, P14, P15
Dummy Table: 3.1(a), 3.1(b), 3.4(a), 3.4(b), 3.4(c), 3.4(d), 3.4(e), 3.5

General Policy Concern 2: What were the school context factors experienced by Grade 6 pupils (such as location, absenteeism (regularity and reasons), grade repetition, and homework (frequency, amount, correction, and family involvement)) that might impact upon teaching/learning and the general functioning of schools?

Specific Research Questions

- What was the location of the school?
Questionnaire: SI: S11, S12; SII: S13, S14
Dummy Table: 7.2
- How many days were pupils absent in the previous month, and what were the reasons for these absences?
Questionnaire: SI: P19; SII: P16, P17
Dummy Table: 3.2(a), 3.2(b), 3.2(c)
- How many pupils had repeated a grade, and were they currently repeating Grade 6?
Questionnaire: SI: P23; SII: P18
Dummy Table: 3.2(a), 3.2(b)
- How frequently did pupils receive homework in reading and mathematics?
Questionnaire: SI: P11; SII: P33, P36
Dummy Table: 8.4(a)
- Did the teachers correct assigned homework?
Questionnaire: SII: P34, P37
Dummy Table: 8.4(b), 8.4(c)
- Did family members monitor, assist with, request demonstrations, ask questions about, and/or look at, pupils' homework?
Questionnaire: : SI: P12, P13, P14, P15, P16; SII: P24, P25, P26, P27, P28, P29, P30
Dummy Table: 9.7(a), 9.7(b), 9.7(c)

General Policy Concern 3: Did Grade 6 pupils have sufficient access to classroom materials (for example, textbooks, readers, and stationery) in order to participate fully in their lessons?

Specific Research Questions

- What percentage of students had reading and mathematics textbooks?
Questionnaire: : SI: P20; SII: P35, P38
Dummy Table: 6.4
- What percentage of pupils had adequate basic classroom supplies for writing, ruling, erasing, etc.?
Questionnaire: : SI: P22; SII: P21
Dummy Table: 6.5(a), 6.5(b)

General Policy Concern 4: Did Grade 6 pupils have access to library books within their schools, and (if they did have access) was the use of these books being maximized by allowing pupils to take them home to read?

Specific Research Questions

- What percentage of pupils had access to (school and classroom) library facilities?
Questionnaire: : SI: T10.9, S31.01; SII: T12.6, S38.01
Dummy Table: 6.1, 7.3
- Were pupils permitted to take library books home? (This question to be crosschecked from pupil and school head questionnaires.)
Questionnaire: : SI: P21, S34; SII: P20, S39
Dummy Table: 11.1

General Policy Concern 5: Has the practice of Grade 6 pupils receiving extra lessons in school subjects outside school hours become widespread, and have these been paid lessons?

Specific Research Questions

- What percentage of pupils received extra tuition?
Questionnaire: : SI: P17; SII: P31
Dummy Table: 8.3(a)
- Was payment made for receiving extra tuition?
Questionnaire: : SII: P32
Dummy Table: 8.3(b)

General Policy Concern 6: What were the personal characteristics of Grade 6 teachers (for example, age, gender, and socio-economic level), and what was the condition of their housing?

Specific Research Questions

- What was the age distribution of teachers?
Questionnaire: SI: T3; SII: T3
Dummy Table: 4.1(a), 4.1(b)
- What was the gender distribution of teachers?
Questionnaire: SI: T2; SII: T2
Dummy Table: 4.1(a), 4.1(b)
- What was the socio-economic status of teachers in terms of possessions and livestock?
Questionnaire: SI: T28; SII: T27, T28
Dummy Table: 4.1(a), 4.1(b), 11.2(a), 11.2(b)
- What was the general condition (repair status and lighting) of teacher housing?
Questionnaire: SI: T31; SII: T29, T30,
Dummy Table: 4.5, 11.3(a), 11.3(b)

General Policy Concern 7: What were the professional characteristics of Grade 6 teachers (in terms of academic, professional, and in-service training), and did they consider in-service training to be effective in improving their teaching?

Specific Research Questions

- How many years of academic education had teachers completed?
Questionnaire: SI: T4; SII: T4
Dummy Table: 4.3(a), 4.3(b), 4.3(c)
- How many years of teacher training had teachers completed?
Questionnaire: SI: T5; SII: T5
Dummy Table: 4.2(a), 4.2(b)
- How many years of teaching experience had teachers completed?
Questionnaire: SI: T6; SII: T6
Dummy Table: 4.2(a), 4.2(b)
- How much in-service training had teachers completed?
Questionnaire: SI: T7; SII: T7, T8
Dummy Table: 4.4(a), 4.4(b)
- Did teachers consider that in-service training improved their teaching?
Questionnaire: SII: T9
Dummy Table: 9.8

General Policy Concern 8: How did Grade 6 teachers allocate their time among responsibilities concerned with teaching, preparing lessons, and marking?

Specific Research Questions

- How many periods did teachers teach and how long were these periods?
Questionnaire: SI: T11, T12; SII: T14, T15
Dummy Table: 11.4
- How many hours per week did teachers spend in lesson preparation and marking?
Questionnaire: SI: T13; SII: T16
Dummy Table: 8.5

General Policy Concern 9: What were Grade 6 teachers' viewpoints on (a) pupil activities within the classroom (for example, reading aloud, pronouncing, etc.), (b) teaching goals (for example, making learning enjoyable, word attack skills, etc.) (c) teaching approaches/strategies (for example, questioning, whole class teaching, etc.), (d) assessment procedures, and (e) meeting and communicating with parents?

Specific Research Questions

- What did teachers consider to be the most important pupil activities for teaching reading and mathematics?
Questionnaire: SI: T15; SII: T33, T41
Dummy Table: 8.1(a)(i), 8.1(b)(i)
- What did teachers consider to be the most important teaching goals in reading and mathematics?
Questionnaire: SI: T18; SII: T36, T44
Dummy Table: 8.1(a)(ii), 8.1(b)(ii)

- What teaching approaches/strategies were used most frequently by reading and mathematics teachers?
Questionnaire: SI: T19; SII: T37, T45
Dummy Table: 8.1(a)(iii), 8.1(b)(iii)
- How often did teachers give written tests in reading and mathematics?
Questionnaire: SI: T20; SII: T38, T46
Dummy Table: 8.1(a)(iv), 8.1(b)(iv)
- Was there a specific section in pupil school reports for reading and mathematics?
Questionnaire: SI: T22; SII: T31, T39
Dummy Table: 11.5
- How often did teachers meet with parents each year?
Questionnaire: SI: T21; SII: T17
Dummy Table: 9.3
- What percentage of parents met with teachers each year?
Questionnaire: SII: T18
Dummy Table: 11.6
- Did teachers ask parents to sign homework assignments?
Questionnaire: SI: T16; SII: T34, T42
Dummy Table: 11.7

General Policy Concern 10: What was the availability of classroom furniture (for example, sitting/writing places, teacher table, teacher chair, and bookshelves) and classroom equipment (for example, chalkboard, dictionary, maps, book corner, and teacher guides) in Grade 6 classrooms?

Specific Research Questions

- What percentages of pupils were in classrooms with adequate sitting and writing places?
Questionnaire: SI: P24, P25; SII: P22, P23
Dummy Table: 6.3
- What percentages of pupils were in classrooms with adequate classroom furniture and equipment (for example, a teacher table, teacher chair, bookshelves, and chalkboard)?
Questionnaire: SI: T10; SII: T12
Dummy Table: 6.1, 6.2
- How many books did teachers have in their classroom library or book corner?
Questionnaire: SI: T8; SII: T10
Dummy Table: 11.8
- Did teachers have teaching aids (for example, a map, dictionary, geometrical instruments, and teachers' guides)?
Questionnaire: SII: T13.1, T13.2, T13.3, T13.4, T13.5
Dummy Table: 11.9(a), 11.9(b)

General Policy Concern 11: What professional support (in terms of education resource centres, inspections, advisory visits, and school head inputs) was given to Grade 6 teachers?

Specific Research Questions

- Did teachers use education resource centres?

Questionnaire: SII: T24

Dummy Table: 8.6

- How did teachers use education resource centres?
Questionnaire: SII: T24, T24.1, T24.2, T24.3, T24.4, T24.5, T24.6
Dummy Table: 11.10(a), 11.10(b)
- What support did Advisors or Inspectors give to teachers in terms of administrative, professional, and pedagogical matters?
Questionnaire: SII: T20, T21
Dummy Table: 9.9
- Did school heads advise teachers on their teaching?
Questionnaire: SI: T25; SII: T22
Dummy Table: 9.2

General Policy Concern 12: What factors had most impact upon teacher job satisfaction?

Specific Research Questions

- What factors (for example, living conditions, school facilities/equipment, staff relationships, career advancement, salaries, etc.) had most impact upon teachers' job satisfaction?
Questionnaire: SI: T26; SII: T25
Dummy Table: 9.1
- What did teachers rate as the most important factor?
Questionnaire: SI: T27; SII: T26
Dummy Table: 11.11

General Policy Concern 13: What were the personal characteristics of school heads (for example, age and gender)?

Specific Research Questions

- What was the age distribution of school heads?
Questionnaire: SI: S2; SII: S2
Dummy Table: 5.1
- What was the gender distribution of school heads?
Questionnaire: SI: S1; SII: S1
Dummy Table: 5.1

General Policy Concern 14: What were the professional characteristics of school heads (in terms of academic, professional, experience, and specialized training)?

Specific Research Questions

- How many years of academic education had school heads completed?
Questionnaire: SI: S3; SII: S3
Dummy Table: 11.12(a), 11.12(b)
- How many years of teacher training had school heads completed?
Questionnaire: SI: S4; SII: S4
Dummy Table: 5.2

- How many years of teaching experience had school heads completed?
Questionnaire: SI: S5; SII: S6
Dummy Table: 5.2
- How many years of experience had school heads had either as a school head or an acting school head – in the current school and all together?
Questionnaire: SI: S8, S9; SII: S9, S10
Dummy Table: 11.13
- Have school heads received specialized training in school management?
Questionnaire: SII: S5
Dummy Table: 5.2

General Policy Concern 15: What were the school heads' viewpoints on general school infrastructure (for example, electrical and other equipment, water, and basic sanitation) and the condition of school buildings?

Specific Research Questions

- What items of equipment (telephone, fax, photocopier) and general facilities (library, staff room, store room) did schools have?
Questionnaire: SI: S31; SII: S38
Dummy Table: 7.3
- What kind of water supply did schools have?
Questionnaire: SI: S31.10; SII: S38.08
Dummy Table: 7.3
- What was the nature and provision of toilet facilities in schools?
Questionnaire: SI: S30; SII: S37
Dummy Table: 7.1
- What was the general condition of school buildings?
Questionnaire: SI: S29; SII: S36
Dummy Table: 7.1

General Policy Concern 16: What were the school heads' viewpoints on (a) daily activities (for example, teaching, school-community relations, and monitoring pupil progress), (b) organizational policies (for example school magazine, open days, and formal debates), (c) inspections, (d) community input, (e) problems with pupils and staff (for example, pupil lateness, teacher absenteeism, and lost days of school)?

Specific Research Questions

- What amount of teaching did school heads undertake?
Questionnaire: SI: S7; SII: S7, S8
Dummy Table: 5.3
- What level of importance did school heads attach to activities such as community contacts, monitoring pupil progress, administrative tasks, etc.?
Questionnaire: SI: S22; SII: S28
Dummy Table: 9.4
- What was the incidence of school activities such as a school magazine, public speaking day, "open days, etc.?"

Questionnaire: SI: S24; SII: S30

Dummy Table: 8.2

- How many school days were lost in the last school year due to non-school events?
Questionnaire: SI: S26; SII: S33
Dummy Table: 7.4
- What were the purposes and frequency of school inspections?
Questionnaire: SII: S24, S25
Dummy Table: 8.7, 11.14
- What was the contribution of the school community (in terms of time and resources for maintaining the school and for providing supplementary funding)?
Questionnaire: SII: S40
Dummy Table: 9.10
- What were the main behavioural problems of pupils?
Questionnaire: SI: S25; SII: S31
Dummy Table: 9.5(a), 9.5(b)
- What were the main behavioural problems of teachers?
Questionnaire: SI: S25; SII: S32
Dummy Table: 9.6(a), 9.6(b)

General Policy Concern 17: Have human resources (for example, qualified and experienced teachers and school heads) been allocated in an equitable fashion among regions and among schools within regions?

Specific Research Questions

- Were qualified and experienced Grade 6 teachers and school heads distributed equitably among regions and among schools within regions?
Questionnaire: SI: T4, T5, T6, T23, S3, S4, S5, S13, S18; SII: T4, T5, T6, T19, S3, S4, S6, S15, S18
Dummy Table: 11.15(a), 11.15(b)

General Policy Concern 18: Have material resources (for example, classroom teaching materials and school facilities) been allocated in an equitable fashion among regions and among schools within regions?

Specific Research Questions

- Were (a) general school infrastructure, (b) classroom equipment, and (c) classroom teaching materials distributed equitably among regions and among schools within regions?
Questionnaire: SI: T10, T31, S20, S28, S30, S31; SII: T12, T30, S22, S35, S37, S38
Dummy Table: 11.16(a), 11.16(b)

General Policy Concern 19: What were the levels (according to Rasch scores and descriptive levels of competence) and variations (among schools and regions) in the achievement levels of Grade 6 pupils and their teachers in reading and mathematics – for my country and for all other SACMEQ countries?

Specific Research Questions

- What were the overall mean Rasch scores of pupils and their teachers in reading and mathematics across the SACMEQ countries?
Questionnaire: SI: PRT; SII: PRT, PMT, TRT, TMT
Dummy Table: 11.18(a), 11.18(b)
- What were the percentages of between and within school variance associated with pupil Rasch scores in reading and mathematics across the SACMEQ countries?
Questionnaire: SI: PRT; SII: PRT, PMT, TRT, TMT
Dummy Table: 11.19(a), 11.19(b)
- What were the overall percentages of pupils and their teachers across the various levels of competence in reading and mathematics across the SACMEQ countries?
Questionnaire: SI: PRT; SII: PRT, PMT, TRT, TMT
Dummy Table: 11.20(a), 11.20(b)

General Policy Concern 20: What were the reading and mathematics achievement levels of important sub-groups of Grade 6 pupils and their teachers (for example, pupils and teachers of different genders, socio-economic levels, and locations)?

Specific Research Questions

- What were the gender differences in reading and mathematics achievement for pupils and teachers?
Questionnaire: SI: PRT, P3; SII: PRT, PMT, TRT, TMT, P3, T2
Dummy Table: 11.21
- What were the school location differences in reading and mathematics achievement for pupils and teachers?
Questionnaire: SI: PRT, S12; SII: PRT, PMT, TRT, TMT, S14
Dummy Table: 11.22
- What were the socioeconomic differences in reading and mathematics achievement for pupils and teachers?
Questionnaire: SI: PRT, P8; SII: PRT, PMT, TRT, TMT, P7, T27
Dummy Table: 11.23

Appendix B

Reading Test Items Considered to be Central to the Core Curriculum in Each Country)

item #	Type	BOT	KEN	LES	MAL	MAU	MOZ	NAM	SEY	SOU	SWA	TAN	UGA	ZAM	ZAN
1	Word recognition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
2		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
3		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
4		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes
5		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
6		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	Yes
7	Sentence completion with a word	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
11			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	
12	Sentence completion with a phrase	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14			Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	Narrative	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	Document	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	Narrative	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
24		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	Document	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
27		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
28		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
29	Expository	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
30		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
31				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
32		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
33	Document	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
34		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
35	Document	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Appendix B (Ctd.)

Item #	Type	BOT	KEN	LES	MAL	MAU	MOZ	NAM	SEY	SOU	SWA	TAN	UGA	ZAM	ZAN
41	Expository	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
42		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes		Yes
44		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	Narrative	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
47		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
48		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
50	Expository	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
51		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
53		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54	Documents	Yes	Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes
55		Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes
56		Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
57		Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
58	Expository	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
59		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
60		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
61	Narrative	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
62		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
64		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
65	Expository	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
66		Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
67		Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
68				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
69		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
70	Expository	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
71		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
72		Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
73	Document	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
74		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
75		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
76		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
77	Expository	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
78							Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
79		Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
80	Expository						Yes			Yes	Yes	Yes	Yes		Yes
81							Yes			Yes	Yes	Yes	Yes		Yes
82		Yes					Yes			Yes	Yes	Yes	Yes		Yes
83							Yes			Yes	Yes	Yes	Yes		Yes

Note: The shaded items were excluded from the final analyses because they failed a Rasch “differential item functioning” test across three groups: SACMEQ I pupils, SACMEQ II pupils, and SACMEQ II teachers.

Appendix C

Mathematics Test Items Considered to be Central to the Core Curriculum in Each Country)

Item #	Type	BOT	KEN	LES	MAL	MAU	MOZ	NAM	SEY	SOU	SWA	TAN	UGA	ZAM	ZAN
1	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
2	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
3	Number	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
4	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	Space/Data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	Space/Data	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
7	Space/Data	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	Number	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
11	Number	Yes	Yes	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	
12	Number	Yes	Yes	Yes	Yes			Yes		Yes	Yes	Yes	Yes	Yes	Yes
13	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
14	Number	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	Measurement	Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes
16	Measurement	Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes
17	Measurement	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
18	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
19	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
20	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
21	Space/Data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	Number	Yes	Yes	Yes	Yes			Yes		Yes	Yes	Yes	Yes	Yes	Yes
23	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	Space/Data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	Space/Data	Yes		Yes		Yes		Yes		Yes	Yes	Yes	Yes		
27	Number	Yes	Yes				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	Number	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	Number	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	
30	Space/Data	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
31	Measurement	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
32	Space/Data	Yes	Yes		Yes	Yes	Yes			Yes		Yes	Yes		
33	Space/Data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
34	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
35	Number	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes
36	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38	Number	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39	Space/Data	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
40	Space/Data	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		

Appendix C (Ctd.)

item #	Type	BOT	KEN	LES	MAL	MAU	MOZ	NAM	SEY	SOU	SWA	TAN	UGA	ZAM	ZAN
41	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
42	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	Number	Yes			Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	Measurement	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	
45	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
47	Measurement	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
48	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
49	Measurement	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
50	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
51	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52	Space/Data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
53	Space/Data	Yes	Yes		Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes	
54	Measurement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
55	Measurement	Yes				Yes	Yes			Yes	Yes	Yes	Yes		
56	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
57	Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
58	Space/Data	Yes		Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	
59	Number	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
60	Number	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
61	Number	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
62	Number	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63	Measurement	Yes				Yes	Yes			Yes	Yes	Yes	Yes	Yes	

Note: The shaded items were excluded from the final analyses because they failed a Rasch “differential item functioning” test across three groups: SACMEQ I pupils, SACMEQ II pupils, and SACMEQ II teachers.

Appendix D

Sample Design Tables for $\rho = 0.1, 0.2, 0.3$

Cluster Size		95% Confidence Limits for Means/Percentages							
		$\pm 0.05s/\pm 2.5\%$		$\pm 0.1s/\pm 5.0\%$		$\pm 0.15s/\pm 7.5\%$		$\pm 0.2s/\pm 10.0\%$	
<i>b</i>		<i>a</i>	<i>n</i>	<i>a</i>	<i>n</i>	<i>a</i>	<i>n</i>	<i>a</i>	<i>n</i>
<u><i>roh = 0.1</i></u>									
1 (SRS)		1600	1600	400	400	178	178	100	100
2		880	1760	220	440	98	196	55	110
5		448	2240	112	560	50	250	28	140
10		304	3040	76	760	34	340	19	190
15		256	3840	64	960	29	435	16	240
20		232	4640	58	1160	26	520	15	300
30		208	6240	52	1560	24	720	13	390
40		196	7840	49	1960	22	880	13	520
50		189	9450	48	2400	21	1050	12	600
<u><i>roh = 0.2</i></u>									
1 (SRS)		1600	1600	400	400	178	178	100	100
2		960	1920	240	480	107	214	60	120
5		576	2880	144	720	65	325	36	180
10		448	4480	112	1120	50	500	28	280
15		406	6090	102	1530	46	690	26	390
20		384	7680	96	1920	43	860	24	480
30		363	10890	91	2730	41	1230	23	690
40		352	14080	88	3520	40	1600	22	880
50		346	17300	87	4350	39	1950	22	1100
<u><i>roh = 0.3</i></u>									

<i>1 (SRS)</i>	<i>1600</i>	<i>1600</i>	<i>400</i>	<i>400</i>	<i>178</i>	<i>178</i>	<i>100</i>	<i>100</i>
<i>2</i>	<i>1040</i>	<i>2080</i>	<i>260</i>	<i>520</i>	<i>116</i>	<i>232</i>	<i>65</i>	<i>130</i>
<i>5</i>	<i>704</i>	<i>3520</i>	<i>176</i>	<i>880</i>	<i>79</i>	<i>395</i>	<i>44</i>	<i>220</i>
<i>10</i>	<i>592</i>	<i>5920</i>	<i>148</i>	<i>1480</i>	<i>66</i>	<i>660</i>	<i>37</i>	<i>370</i>
<i>15</i>	<i>555</i>	<i>8325</i>	<i>139</i>	<i>2085</i>	<i>62</i>	<i>930</i>	<i>35</i>	<i>525</i>
<i>20</i>	<i>536</i>	<i>10720</i>	<i>134</i>	<i>2680</i>	<i>60</i>	<i>1200</i>	<i>34</i>	<i>680</i>
<i>30</i>	<i>518</i>	<i>15540</i>	<i>130</i>	<i>3900</i>	<i>58</i>	<i>1740</i>	<i>33</i>	<i>990</i>
<i>40</i>	<i>508</i>	<i>20320</i>	<i>127</i>	<i>5080</i>	<i>57</i>	<i>2280</i>	<i>32</i>	<i>1280</i>
<i>50</i>	<i>503</i>	<i>25150</i>	<i>126</i>	<i>6300</i>	<i>56</i>	<i>2800</i>	<i>32</i>	<i>1600</i>

Appendix D (Ctd.)

Sample Design Tables for $\rho = 0.4, 0.5, 0.6$

Cluster Size		95% Confidence Limits for Means/Percentages							
		$\pm 0.05s/\pm 2.5\%$		$\pm 0.1s/\pm 5.0\%$		$\pm 0.15s/\pm 7.5\%$		$\pm 0.2s/\pm 10.0\%$	
<i>b</i>		<i>a</i>	<i>n</i>	<i>a</i>	<i>n</i>	<i>a</i>	<i>n</i>	<i>a</i>	<i>n</i>
<u><i>roh = 0.4</i></u>									
1 (SRS)		1600	1600	400	400	178	178	100	100
2		1120	2240	280	560	125	250	70	140
5		832	4160	208	1040	93	465	52	260
10		736	7360	184	1840	82	820	46	460
15		704	10560	176	2640	79	1185	44	660
20		688	13760	172	3440	77	1540	43	860
30		672	20160	168	5040	75	2250	42	1260
40		664	26560	166	6640	74	2960	42	1680
50		660	33000	165	8250	74	3700	42	2100
<u><i>roh = 0.5</i></u>									
1 (SRS)		1600	1600	400	400	178	178	100	100
2		1200	2400	300	600	134	268	75	150
5		960	4800	240	1200	107	535	60	300
10		880	8800	220	2200	98	980	55	550
15		854	12810	214	3210	95	1425	54	810
20		840	16800	210	4200	94	1880	53	1060
30		827	24810	207	6210	92	2760	52	1560
40		820	32800	205	8200	92	3680	52	2080
50		816	40800	204	10200	91	4550	51	2550
<u><i>roh = 0.6</i></u>									

<i>1 (SRS)</i>	<i>1600</i>	<i>1600</i>	<i>400</i>	<i>400</i>	<i>178</i>	<i>178</i>	<i>100</i>	<i>100</i>
<i>2</i>	<i>1280</i>	<i>2560</i>	<i>320</i>	<i>640</i>	<i>143</i>	<i>286</i>	<i>80</i>	<i>160</i>
<i>5</i>	<i>1088</i>	<i>5440</i>	<i>272</i>	<i>1360</i>	<i>122</i>	<i>610</i>	<i>68</i>	<i>340</i>
<i>10</i>	<i>1024</i>	<i>10240</i>	<i>256</i>	<i>2560</i>	<i>114</i>	<i>1140</i>	<i>64</i>	<i>640</i>
<i>15</i>	<i>1003</i>	<i>15045</i>	<i>251</i>	<i>3765</i>	<i>112</i>	<i>1680</i>	<i>63</i>	<i>945</i>
<i>20</i>	<i>992</i>	<i>19840</i>	<i>248</i>	<i>4960</i>	<i>111</i>	<i>2220</i>	<i>62</i>	<i>1240</i>
<i>30</i>	<i>982</i>	<i>29460</i>	<i>246</i>	<i>7380</i>	<i>110</i>	<i>3300</i>	<i>62</i>	<i>1860</i>
<i>40</i>	<i>976</i>	<i>39040</i>	<i>244</i>	<i>9760</i>	<i>109</i>	<i>4360</i>	<i>61</i>	<i>2440</i>
<i>50</i>	<i>973</i>	<i>48650</i>	<i>244</i>	<i>12200</i>	<i>109</i>	<i>5450</i>	<i>61</i>	<i>3050</i>

Appendix D (Ctd.)

Sample Design Tables for $\rho = 0.7, 0.8, 0.9$

Cluster Size		95% Confidence Limits for Means/Percentages							
		$\pm 0.05s/\pm 2.5\%$		$\pm 0.1s/\pm 5.0\%$		$\pm 0.15s/\pm 7.5\%$		$\pm 0.2s/\pm 10.0\%$	
<i>b</i>		<i>a</i>	<i>n</i>	<i>a</i>	<i>n</i>	<i>a</i>	<i>n</i>	<i>a</i>	<i>n</i>
<u><i>roh = 0.7</i></u>									
1 (SRS)		1600	1600	400	400	178	178	100	100
2		1360	2720	340	680	152	304	85	170
5		1216	6080	304	1520	136	680	76	380
10		1168	11680	292	2920	130	1300	73	730
15		1152	17280	288	4320	129	1935	72	1080
20		1144	22880	286	5720	128	2560	72	1440
30		1136	34080	284	8520	127	3810	71	2130
40		1132	45280	283	11320	126	5040	71	2840
50		1130	56500	283	14150	126	6300	71	3550
<u><i>roh = 0.8</i></u>									
1 (SRS)		1600	1600	400	400	178	178	100	100
2		1440	2880	360	720	161	322	90	180
5		1344	6720	336	1680	150	750	84	420
10		1312	13120	328	3280	146	1460	82	820
15		1302	19530	326	4890	145	2175	82	1230
20		1296	25920	324	6480	145	2900	81	1620
30		1291	38730	323	9690	144	4320	81	2430
40		1288	51520	322	12880	144	5760	81	3240
50		1287	64350	322	16100	144	7200	81	4050
<u><i>roh = 0.9</i></u>									

<i>1 (SRS)</i>	<i>1600</i>	<i>1600</i>	<i>400</i>	<i>400</i>	<i>178</i>	<i>178</i>	<i>100</i>	<i>100</i>
<i>2</i>	<i>1520</i>	<i>3040</i>	<i>380</i>	<i>760</i>	<i>170</i>	<i>340</i>	<i>95</i>	<i>190</i>
<i>5</i>	<i>1472</i>	<i>7360</i>	<i>368</i>	<i>1840</i>	<i>164</i>	<i>820</i>	<i>92</i>	<i>460</i>
<i>10</i>	<i>1456</i>	<i>14560</i>	<i>364</i>	<i>3640</i>	<i>162</i>	<i>1620</i>	<i>91</i>	<i>910</i>
<i>15</i>	<i>1451</i>	<i>21765</i>	<i>363</i>	<i>5445</i>	<i>162</i>	<i>2430</i>	<i>91</i>	<i>1365</i>
<i>20</i>	<i>1448</i>	<i>28960</i>	<i>362</i>	<i>7240</i>	<i>162</i>	<i>3240</i>	<i>91</i>	<i>1820</i>
<i>30</i>	<i>1446</i>	<i>43380</i>	<i>362</i>	<i>10860</i>	<i>161</i>	<i>4830</i>	<i>91</i>	<i>2730</i>
<i>40</i>	<i>1444</i>	<i>57760</i>	<i>361</i>	<i>14440</i>	<i>161</i>	<i>6440</i>	<i>91</i>	<i>3640</i>
<i>50</i>	<i>1444</i>	<i>72200</i>	<i>361</i>	<i>18050</i>	<i>161</i>	<i>8050</i>	<i>91</i>	<i>4550</i>

Appendix E

Random Number Tables for the Selection of 20 Grade 6 Students within each Selected School

Case#	R21	R22	R23	R24	R25	R26	R27	R28	R29	R30	R31	R32	R33	R34	R35	Case#	R36	R37	R38	R39	R40	R41	R42	R43	R44	R45	R46	R47	R48	R49	R50
1	1	1	1	1	1	1	1	1	1	2	2	1	1	2	1	1	1	3	1	1	1	3	4	2	1	1	2	1	2		
2	2	2	2	2	2	2	2	2	3	3	3	2	3	3	3	2	5	2	5	6	2	2	5	4	5	5	2	2	3	2	4
3	3	3	3	3	3	3	3	3	4	4	6	3	4	4	4	3	6	3	6	7	4	6	6	6	6	3	6	5	6	5	
4	4	4	4	4	4	5	4	6	5	7	7	5	5	6	6	4	8	4	7	8	7	7	8	10	13	8	4	11	7	9	6
5	5	5	5	5	5	6	5	7	6	8	8	7	7	9	7	5	10	7	10	11	10	8	11	12	15	9	10	12	8	10	8
6	6	6	6	6	6	7	6	8	7	9	9	8	9	12	12	6	11	8	11	13	11	10	13	13	16	10	11	13	10	13	9
7	7	7	7	7	7	8	7	11	8	10	11	9	11	14	13	7	13	9	12	15	14	11	14	15	19	12	15	17	13	15	14
8	8	8	8	8	8	10	8	12	9	11	12	10	12	15	15	8	14	12	16	17	16	12	17	16	22	13	19	18	17	16	21
9	9	9	9	9	12	11	9	13	10	13	13	11	14	17	16	9	17	14	17	18	17	13	18	20	23	15	20	20	18	17	22
10	10	10	11	11	13	13	10	14	12	14	14	13	15	18	17	10	18	15	24	19	18	15	20	26	26	17	21	21	19	23	23
11	11	11	12	12	14	14	11	15	13	15	17	14	16	19	20	11	19	16	25	21	21	17	22	28	28	22	26	27	20	32	24
12	13	13	13	15	15	15	12	16	16	17	18	16	17	21	21	12	23	17	26	23	22	19	23	32	33	23	30	28	21	33	25
13	14	14	15	17	16	16	16	17	19	18	20	17	19	23	22	13	24	19	27	26	23	22	24	33	34	25	31	29	25	34	27
14	15	15	16	18	17	17	18	19	20	19	22	20	21	27	23	14	25	20	29	28	24	23	25	34	35	27	33	30	28	35	29
15	16	16	17	19	18	20	19	20	22	20	24	23	22	28	24	15	26	24	30	31	30	26	29	35	36	29	35	35	30	36	31
16	17	18	18	20	19	21	20	21	24	22	26	25	24	29	25	16	30	28	31	33	32	28	30	36	37	30	37	43	32	38	33
17	18	19	20	21	20	22	22	22	25	23	27	27	27	30	28	17	31	30	32	34	34	29	31	38	38	34	38	44	34	41	34
18	19	20	21	22	21	23	23	23	26	24	28	29	30	31	32	18	33	31	33	35	35	31	33	39	39	36	40	45	39	45	40
19	20	21	22	23	23	24	25	24	27	25	29	30	32	32	33	19	35	32	35	36	37	38	34	42	40	41	44	46	44	48	43
20	21	22	23	24	24	25	26	25	29	27	31	31	33	34	34	20	36	35	38	39	39	41	35	43	41	44	45	47	48	49	50

Case#	R51	R52	R53	R54	R55	R56	R57	R58	R59	R60	R61	R62	R63	R64	R65	Case#	R66	R67	R68	R69	R70	R71	R72	R73	R74	R75	R76	R77	R78	R79	R80
1	1	2	3	3	1	6	2	1	1	1	2	4	8	2	3	1	4	1	4	3	6	1	2	1	1	4	3	7	6		
2	3	3	4	5	8	7	5	3	3	2	5	6	15	6	6	2	10	6	6	7	9	5	8	3	7	3	5	7	4	8	12
3	4	5	5	6	9	8	9	6	5	15	10	8	18	7	8	3	11	9	7	10	10	9	10	4	8	21	7	12	13	11	13
4	10	6	8	15	10	12	13	9	7	16	11	11	20	8	14	4	12	15	9	20	14	12	13	9	10	23	17	15	14	13	14
5	15	12	12	16	11	14	15	10	8	17	21	12	21	9	15	5	16	19	10	21	15	14	14	13	14	28	18	18	16	28	27
6	18	16	17	17	13	16	20	12	12	18	22	19	23	13	17	6	19	22	11	25	18	17	16	14	19	30	19	19	20	29	28
7	19	18	21	18	21	19	22	23	16	19	23	25	26	14	21	7	26	23	13	29	20	22	22	17	23	34	23	20	32	39	30
8	23	21	27	20	24	20	25	25	21	20	24	29	33	18	22	8	27	26	15	30	21	25	23	18	26	37	26	21	34	40	31
9	24	24	29	21	25	21	31	27	24	24	27	33	35	23	25	9	28	30	17	32	27	28	24	19	36	41	28	25	41	41	33
10	28	26	30	23	26	24	33	32	28	25	28	34	36	26	29	10	31	36	25	33	38	29	27	22	38	42	29	26	42	42	35
11	29	27	31	25	27	25	36	33	29	26	31	35	37	28	33	11	34	41	32	35	39	38	30	24	41	44	33	32	48	51	36
12	33	29	32	27	31	26	38	38	31	31	32	36	40	29	35	12	44	48	33	38	43	41	31	29	45	45	41	34	53	53	40
13	35	32	33	34	32	30	39	40	36	35	35	41	43	31	36	13	45	50	35	41	46	46	35	33	47	46	45	41	55	55	45
14	37	33	37	36	34	39	42	43	42	38	40	42	45	33	40	14	46	54	38	47	47	49	38	38	56	50	51	47	56	60	48
15	39	35	38	39	36	41	43	45	45	39	45	46	46	36	41	15	48	60	39	51	51	54	39	39	58	52	52	57	63	62	55
16	42	37	40	41	38	43	44	46	49	41	49	48	49	45	53	16	53	61	47	54	57	55	40	45	62	53	57	60	67	68	58
17	43	39	41	46	39	47	45	48	52	49	55	56	50	54	55	17	55	62	53	55	59	57	43	58	63	56	64	64	70	71	66
18	45	44	43	49	40	49	51	51	53	55	57	57	55	58	61	18	57	63	60	60	60	61	47	64	68	71	65	70	72	73	67

19 47 46 45 51 42 53 54 53 54 56 59 58 60 61 62	19 58 66 65 63 61 70 61 69 70 72 68 74 73 74 73
20 51 48 48 53 51 56 56 55 56 60 61 61 63 64 63	20 59 67 67 68 66 71 71 70 71 73 71 75 75 76 75

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Random Number Tables for the Selection of 20 Grade 6 Students within each Selected School

Case# R81 R82 R83 R84 R85 R86 R87 R88 R89 R90 R91 R92 R93 R94 R95	Case# R96 R97 R98 R99 R100
1 2 1 4 8 7 13 2 3 2 2 3 4 3 4 6	1 6 7 4 1 2
2 3 3 10 10 11 16 3 5 7 4 4 6 6 11 11	2 7 11 9 2 5
3 6 4 11 11 13 17 10 11 14 5 6 7 8 14 20	3 9 13 15 3 6
4 8 5 14 12 15 19 18 12 16 12 9 10 12 19 22	4 13 15 32 6 7
5 12 10 15 13 20 20 21 18 19 15 10 15 31 20 23	5 17 16 38 9 30
6 13 13 25 18 21 21 22 19 31 16 14 19 36 21 27	6 26 25 39 11 33
7 16 17 28 24 24 30 29 22 32 19 16 20 45 32 32	7 35 29 42 15 42
8 22 24 29 30 30 43 30 28 33 23 22 27 48 35 34	8 41 33 51 16 47
9 24 26 30 35 32 50 32 31 40 28 29 34 51 36 36	9 45 37 53 36 51
10 33 32 33 42 34 53 33 39 45 31 31 35 53 43 37	10 56 41 54 39 53
11 41 42 34 43 36 54 34 41 49 36 37 41 54 44 49	11 65 43 57 47 57
12 43 47 39 55 47 65 35 48 50 37 49 50 57 46 52	12 66 50 61 53 64
13 44 52 48 56 52 67 46 50 58 48 50 58 67 47 57	13 68 60 78 73 65
14 54 54 53 58 56 72 48 52 61 52 53 62 70 48 66	14 73 62 82 78 67
15 59 60 60 62 58 76 56 53 62 58 56 66 73 55 69	15 76 65 86 81 78
16 60 64 64 64 60 79 57 55 64 59 68 75 74 61 73	16 82 72 91 82 79
17 65 65 67 69 63 80 61 72 73 64 73 81 78 74 74	17 83 76 92 85 81
18 66 68 68 70 74 81 65 77 77 70 76 84 82 80 77	18 84 77 93 89 87
19 79 69 70 75 77 83 68 78 79 78 84 90 86 86 86	19 89 80 96 91 93
20 80 82 75 77 84 85 75 79 82 81 88 92 88 94 93	20 95 96 98 93 96

Case# R101 R102 R103 R104 R105 R106 R107 R108 R109 R110 R111 R112 R113 R114 R115	Case# R116 R117 R118 R119 R120 R121 R122 R123 R124 R125 R126 R127 R128 R129 R130
1 10 5 4 6 2 4 12 1 1 3 2 6 10 3 2	1 3 4 3 3 20 7 7 12 8 9 2 1 27 1 6
2 11 16 7 8 10 5 21 9 7 4 8 23 13 13 6	2 5 7 12 6 23 13 17 32 10 12 14 8 28 6 15
3 18 22 11 13 16 6 26 10 11 6 10 32 14 15 17	3 6 12 15 8 26 21 18 35 11 18 17 10 30 17 24
4 19 31 25 20 25 8 28 12 13 13 12 54 18 17 25	4 10 19 23 16 38 22 19 38 16 20 20 12 43 20 25
5 25 37 26 28 27 13 37 17 14 20 13 55 22 20 28	5 15 20 27 17 39 27 24 42 26 23 25 24 47 26 28
6 26 42 28 33 39 14 41 25 19 26 18 59 25 25 29	6 19 22 28 22 41 30 29 49 38 25 37 31 48 41 33
7 29 43 38 37 46 15 43 40 21 35 30 66 26 29 39	7 23 28 42 25 43 36 33 68 46 27 41 35 55 50 35
8 45 46 40 42 51 17 44 43 29 44 38 69 30 55 42	8 27 30 53 28 45 41 35 76 47 28 47 43 63 51 36
9 47 51 45 44 52 33 53 44 32 48 48 74 41 56 52	9 33 33 54 44 49 69 37 86 57 36 67 53 65 53 37
10 62 54 49 57 61 40 60 48 34 49 50 78 44 57 62	10 35 39 55 45 61 89 46 90 60 45 71 62 67 68 38
11 65 58 57 62 65 50 61 56 41 50 52 89 47 62 64	11 41 46 60 47 64 92 56 92 65 57 75 65 71 70 41
12 72 61 60 68 68 61 68 59 42 51 56 90 49 74 66	12 52 48 62 52 67 99 65 95 69 59 79 68 79 84 42
13 79 64 67 80 69 63 73 62 47 54 64 98 50 78 79	13 53 54 63 74 71 104 71 96 70 80 88 73 80 88 57
14 88 70 68 85 70 73 74 64 64 66 66 99 64 90 81	14 56 57 73 77 75 105 75 101 81 86 89 79 96 92 67
15 93 73 69 86 77 80 75 68 65 70 81 100 66 92 86	15 57 97 84 78 80 109 78 102 87 92 100 92 103 96 71
16 95 82 72 87 78 85 81 78 71 75 84 104 69 93 87	16 61 99 90 98 83 111 97 106 88 95 101 98 107 115 83
17 96 93 78 88 82 93 88 81 79 78 86 105 73 97 94	17 64 102 105 106 89 114 102 108 94 100 109 99 108 119 85
	18 83 110 108 107 110 116 115 114 95 106 117 100 112 125 102

18	99	94	97	97	90	95	93	87	86	79	91	109	82	99	96	19	95	113	109	114	115	117	117	121	116	113	119	117	113	126	106
19	100	98	101	98	96	96	104	91	97	89	105	110	103	102	103	20	113	115	111	119	119	119	121	123	119	115	124	119	125	129	122
20	101	102	102	102	104	97	105	102	98	108	109	111	107	104	115																

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Random Number Tables for the Selection of 20 Grade 6 Students within each Selected School

Case#	R131	R132	R133	R134	R135	R136	R137	R138	R139	R140	R141	R142	R143	R144	R145	Case#	R146	R147	R148	R149	R150	R151	R152	R153	R154	R155	R156	R157	R158	R159	R160
1	4	5	2	3	3	5	20	35	15	1	1	10	9	3	1	1	5	3	6	3	12	4	6	6	6	10	1	1	9	9	8
2	8	8	6	10	17	7	22	36	18	2	7	12	12	12	5	2	6	12	10	7	18	13	9	10	16	13	15	2	18	19	31
3	39	11	13	13	30	12	34	37	24	8	11	34	17	15	27	3	10	21	13	17	25	15	15	18	25	30	17	11	19	30	33
4	43	26	36	33	31	13	37	53	26	14	27	37	20	16	31	4	14	34	14	29	30	19	19	21	26	40	21	38	25	51	35
5	46	33	38	38	55	15	41	73	28	15	28	38	34	21	39	5	15	35	17	41	33	29	20	22	32	56	22	44	26	64	38
6	54	49	42	55	56	23	51	75	29	18	42	39	37	43	46	6	16	43	20	46	41	30	21	26	39	73	25	49	30	67	57
7	71	62	44	57	70	32	52	78	30	34	45	60	52	48	49	7	17	51	40	50	45	36	22	34	49	74	29	50	36	69	60
8	85	64	51	58	92	42	64	83	38	46	49	61	69	68	52	8	29	62	42	52	51	39	34	40	51	75	47	83	39	81	62
9	86	73	58	59	96	51	70	89	53	49	58	67	72	80	62	9	44	68	45	64	53	46	39	44	52	82	55	89	46	89	72
10	100	78	65	61	102	53	74	90	64	58	59	82	85	93	74	10	54	73	53	69	54	51	43	46	54	83	63	104	51	94	74
11	101	79	67	62	103	59	75	93	65	71	67	85	86	96	76	11	55	75	59	71	58	58	65	51	57	90	72	105	52	100	97
12	104	86	77	66	105	62	76	96	77	81	71	86	90	97	82	12	69	83	60	80	60	62	76	55	63	103	80	107	66	101	123
13	106	88	90	73	107	66	78	105	85	96	77	95	93	106	86	13	76	101	71	87	64	77	82	56	73	108	81	108	70	106	124
14	107	90	99	79	108	92	83	115	86	106	79	97	100	115	111	14	84	103	83	93	102	82	91	60	90	110	86	122	75	109	127
15	108	97	100	86	109	94	85	116	96	114	84	107	105	120	114	15	104	107	92	98	103	98	100	67	102	121	93	125	87	124	128
16	113	115	117	98	110	105	93	117	102	116	101	112	106	127	115	16	108	125	102	107	110	103	105	85	104	125	97	142	94	133	149
17	117	119	118	99	113	107	96	121	107	120	126	118	115	133	118	17	111	128	108	110	117	109	113	90	125	129	103	145	119	142	154
18	127	120	119	112	120	115	99	124	114	122	129	124	122	134	132	18	130	130	135	131	127	111	114	94	133	130	128	148	138	149	155
19	129	129	121	113	129	120	105	130	127	123	136	129	131	142	141	19	133	143	136	134	140	112	132	109	134	140	154	149	145	151	156
20	130	131	133	121	131	125	122	137	137	125	138	135	142	143	142	20	140	145	146	139	150	139	147	149	142	153	155	157	152	154	158

Case#	R161	R162	R163	R164	R165	R166	R167	R168	R169	R170	R171	R172	R173	R174	R175	Case#	R176	R177	R178	R179	R180	R181	R182	R183	R184	R185	R186	R187	R188	R189	R190
1	1	10	16	14	3	13	10	7	2	5	1	7	2	19	8	1	5	2	2	1	1	15	1	2	8	12	6	15	1	5	4
2	2	31	21	27	5	15	29	21	6	18	8	9	6	31	11	2	19	15	5	2	15	17	8	4	9	17	10	17	6	10	10
3	4	52	28	36	16	19	35	23	28	40	14	19	24	38	21	3	20	25	9	21	17	35	15	38	16	38	15	18	13	14	27
4	10	54	29	46	33	42	39	36	41	58	23	27	28	44	44	4	22	31	11	29	27	41	19	44	17	39	28	33	15	16	33
5	39	64	41	51	35	46	53	69	48	64	38	59	37	48	48	5	29	37	13	42	37	45	28	52	26	45	39	40	30	20	37
6	56	66	42	54	42	49	54	90	70	86	39	75	53	51	49	6	45	47	22	44	40	55	52	59	54	51	53	52	44	21	45
7	58	69	46	57	49	64	66	91	74	87	43	77	62	62	59	7	67	62	52	46	58	64	65	74	66	57	88	62	61	38	49
8	63	71	49	62	55	67	81	95	84	105	49	89	71	71	64	8	68	67	69	53	73	70	72	88	73	59	91	68	63	44	56
9	64	75	62	72	61	73	103	107	88	109	59	90	91	77	67	9	73	86	76	64	78	80	73	93	75	60	92	78	82	52	71
10	77	77	70	79	63	104	106	115	101	112	72	93	103	79	70	10	80	87	80	70	104	111	74	97	82	61	97	80	85	69	82
11	84	84	75	89	65	107	117	124	106	125	82	94	119	108	72	11	91	96	81	75	116	114	78	115	85	72	112	107	91	81	119
12	85	87	78	98	78	113	122	128	115	126	87	96	127	111	79	12	99	103	88	76	117	115	80	116	90	73	116	109	104	86	122
13	87	91	79	99	105	115	130	133	117	131	95	113	128	113	94	13	110	109	94	82	118	117	98	123	120	76	126	116	119	105	128
14	97	92	111	119	107	116	134	134	121	134	106	123	129	117	122	14	126	117	101	90	119	119	99	124	133	87	130	124	120	109	134
15	107	93	117	128	119	127	136	138	126	139	127	125	133	131	123	15	129	119	106	129	142	127	120	130	148	96	151	132	123	113	139
16	111	96	146	134	131	146	139	142	137	141	137	134	140	142	131	16	133	124	114	141	144	134	122	149	151	126	153	133	138	114	146
17	115	126	147	142	134	148	147	152	158	152	142	141	146	149	132	17	137	146	133	151	163	140	143	155	167	129	159	155	143	131	148
18	125	128	156	147	143	159	152	153	160	159	143	143	151	153	146	18	140	162	136	159	164	159	163	161	168	146	167	157	148	143	164
19	128	153	157	156	161	164	157	161	163	162	146	159	154	156	159	19	154	164	142	167	167	176	164	164	175	151	168	159	153	171	167
20	155	155	161	162	162	165	162	164	168	163	147	172	163	157	163	20	155	173	154	168	176	178	171	170	180	157	182	167	160	184	187

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Random Number Tables for the Selection of 20 Grade 6 Students within each Selected School

Case#	R191	R192	R193	R194	R195	R196	R197	R198	R199	R200	Case#	R201	R202	R203	R204	R205	R206	R207	R208	R209	R210	R211	R212	R213	R214	R215
1	12	5	9	11	21	2	4	4	7	4	1	7	1	7	16	4	11	5	9	8	2	17	1	6	1	5
2	22	10	12	14	22	6	14	8	9	16	2	17	16	8	30	40	15	23	10	15	16	19	26	11	8	9
3	24	13	30	17	35	12	40	27	13	38	3	21	28	21	63	47	37	38	12	19	20	25	40	14	31	25
4	45	15	42	25	39	13	53	28	32	41	4	56	29	22	72	55	41	43	21	29	39	34	42	25	39	31
5	49	23	46	32	45	18	54	41	64	43	5	62	38	31	75	96	46	58	34	69	50	41	65	36	45	32
6	55	26	56	35	54	25	78	49	66	54	6	66	44	32	76	105	49	67	41	72	67	44	69	37	52	38
7	59	35	70	37	75	42	84	77	88	56	7	78	58	44	88	120	50	70	45	84	92	62	73	42	54	39
8	60	52	73	67	79	44	85	80	117	61	8	80	70	57	89	123	52	79	84	90	104	67	75	47	60	55
9	76	57	78	70	100	58	106	89	119	68	9	106	96	59	94	124	70	81	110	95	106	73	110	70	65	58
10	109	84	88	71	109	61	111	94	130	94	10	122	98	71	126	138	73	118	120	114	114	87	113	91	73	60
11	116	86	90	72	111	65	113	95	133	96	11	124	102	78	135	142	94	121	125	117	118	113	114	94	75	71
12	120	105	92	74	113	98	122	104	139	100	12	125	121	86	139	143	121	126	129	118	135	132	158	99	90	79
13	123	123	102	83	115	111	142	105	144	105	13	126	123	87	147	149	139	131	133	124	137	143	159	133	96	92
14	148	126	104	105	132	116	172	111	146	124	14	132	124	90	153	152	142	151	138	148	142	148	163	139	107	93
15	149	132	113	117	144	133	181	151	151	130	15	150	155	146	160	153	151	165	139	149	148	153	164	141	129	107
16	150	140	118	123	154	134	182	154	170	150	16	163	163	147	173	163	155	166	150	152	156	159	177	182	173	115
17	162	152	130	128	156	160	185	166	172	151	17	166	172	164	179	164	166	178	160	155	159	165	187	199	174	118
18	169	154	152	130	162	168	194	175	174	169	18	170	182	172	184	165	179	179	191	176	185	168	191	201	186	160
19	170	160	153	135	167	173	195	196	177	172	19	192	185	178	190	171	201	185	201	198	190	200	208	202	189	210
20	184	166	173	156	173	174	196	198	182	198	20	194	190	180	193	198	204	189	202	199	203	206	211	206	198	213

Case#	R216	R217	R218	R219	R220	R221	R222	R223	R224	R225	R226	R227	R228	R229	R230	Case#	R231	R232	R233	R234	R235	R236	R237	R238	R239	R240	R241	R242	R243	R244	R245
1	10	21	14	1	2	1	10	1	5	1	10	35	2	6	3	1	22	3	14	19	4	43	21	2	1	15	24	4	4	24	12
2	12	31	31	7	5	12	18	3	13	12	14	40	5	12	7	2	24	7	35	31	22	46	24	8	5	36	27	8	67	28	30
3	16	37	32	8	11	13	20	4	35	19	47	70	36	49	24	3	36	23	39	44	28	48	55	31	11	49	30	16	77	38	61
4	20	48	34	12	15	25	24	18	41	29	66	77	44	60	28	4	38	65	55	58	38	55	56	35	42	76	42	30	85	49	62
5	23	71	37	22	68	51	25	37	46	32	71	78	55	78	33	5	54	103	66	62	39	62	66	40	45	79	61	41	109	52	74
6	43	79	46	86	75	54	29	54	54	50	78	79	56	85	75	6	72	106	98	65	46	65	79	45	49	84	79	44	110	56	77
7	51	102	54	87	83	60	31	57	55	70	102	137	57	100	88	7	77	107	112	79	58	66	88	56	68	88	93	45	116	57	89
8	53	109	65	91	94	86	72	77	64	101	108	138	65	110	121	8	94	143	115	80	61	75	89	59	70	120	96	46	122	67	91
9	72	125	69	108	98	98	75	81	81	126	111	139	79	114	126	9	95	144	121	82	77	86	93	63	79	126	101	49	129	70	96
10	87	127	79	122	108	103	82	101	120	135	120	152	82	121	131	10	137	153	126	87	79	87	112	64	116	141	112	96	133	107	101
11	120	147	92	124	124	139	104	115	126	152	125	166	83	123	136	11	149	154	133	89	99	101	117	87	118	143	124	156	138	163	102
12	124	158	104	152	132	158	116	122	141	164	132	172	92	126	137	12	170	155	137	92	103	107	134	99	143	159	171	162	139	177	104
13	140	163	116	157	147	175	118	128	155	167	135	173	109	144	139	13	177	175	141	151	127	145	135	105	145	165	173	163	160	185	114
14	142	164	119	164	150	184	122	144	156	173	142	176	126	151	143	14	180	179	151	159	133	170	145	122	186	172	174	174	163	188	128
15	146	170	135	169	159	185	131	152	159	179	147	179	152	162	148	15	185	180	160	181	168	190	155	143	200	201	184	178	170	191	150
16	169	185	137	178	160	186	143	182	171	187	171	184	166	163	182	16	186	184	174	184	182	196	183	178	207	206	197	191	197	207	190
17	171	188	139	180	168	188	148	196	183	210	189	196	173	177	201	17	201	195	180	189	191	199	202	187	208	208	201	209	199	209	196
18	176	199	145	205	171	193	167	199	193	213	203	200	179	178	209	18	209	208	210	213	203	222	210	204	213	218	223	220	200	221	198
19	186	203	159	206	197	217	174	207	205	214	218	214	203	217	218	19	217	216	217	218	217	227	211	225	221	222	229	229	219	232	235
20	199	214	165	219	209	219	210	216	216	225	219	219	205	224	221	20	228	223	228	233	230	230	236	229	228	240	241	241	228	243	240

Appendix F

The 148 Test Items (and their Sources) that were Used in the “Hypothetical Test” for Calibrating the Reading Test Items

Section	RUMM VarName	SPSS VarName	KEY	S2P	S2T	S1P	Zim91	IEA Pop1	IEA Pop2
Section A	I0001	RA01XXXX	2	pread01					
	I0002	RA02XXXX	2	pread02					
	I0003	RA03XXXX	3	pread03					
	I0004	RA04XXXX	1	pread04					
	I0005	RA05XXXX	2	pread05					
	I0006	RA06XXXX	1	pread06					
	I0007	RA07XXXX	2	pread07					
	I0008	RA08XXXX	2	pread08					
	I0009	RA09XXXX	2	pread09					
	I0010	RA10XXXX	3	pread10					
	I0011	RA11XXXX	2	pread11					
	I0012	RA12XXXX	2	pread12					
	I0013	RA13XXXX	4	pread13					
	I0014	RA14XXXX	4	pread14					
	I0015	RA22XXXX	3	pread22					
	I0016	RA23XXXX	3	pread23					
	I0017	RA24XXXX	1	pread24					
	I0018	RA25XXXX	1	pread25					
	I0019	RA26XXXX	4	pread26					
	I0020	RA27XXXX	2	pread27					
	I0021	RA28XXXX	2	pread28					
	I0022	RA33XXXX	2	pread33					
	I0023	RA34XXXX	1	pread34					
	I0024	RA35XXXX	1	pread35					
	I0025	RA36XXXX	2	pread36					
	I0026	RA37XXXX	2	pread37					
	I0027	RA38XXXX	2	pread38					
	I0028	RA39XXXX	2	pread39					
	I0029	RA40XXXX	1	pread40					
	I0030	RA41XXXX	1	pread41					
	I0031	RA42XXXX	4	pread42					
	I0032	RA43XXXX	1	pread43					
	I0033	RA44XXXX	1	pread44					
	I0034	RA45XXXX	3	pread45					
	I0035	RA46XXXX	1	pread46					
	I0036	RA58XXXX	1	pread58					
	I0037	RA59XXXX	2	pread59					
	I0038	RA61XXXX	2	pread61					
	I0039	RA62XXXX	2	pread62					
	I0040	RA63XXXX	4	pread63					
	I0041	RA64XXXX	1	pread64					
	I0042	RA70XXXX	1	pread70					
	I0043	RA71XXXX	4	pread71					
	I0044	RA72XXXX	2	pread72					

Section	RUMM VarName	SPSS VarName	KEY	S2P	S2T	S1P	Zim91	IEA Pop1	IEA Pop2
	I0045	RA73XXXX	4	pread73					
	I0046	RA74XXXX	3	pread74					
	I0047	RA75XXXX	3	pread75					
	I0048	RA76XXXX	2	pread76					
	I0049	RA80XXXX	4	pread80					yes
	I0050	RA81XXXX	2	pread81					yes
	I0051	RA82XXXX	4	pread82					yes
	I0052	RA83XXXX	4	pread83					yes
Section B	I0053	RA29XX20	4	pread29		porange1			
	I0054	RA30XX21	1	pread30		porange2			
	I0055	RA31XX22	3	pread31		porange3			
	I0056	RA32XX23	4	pread32		porange4			
	I0057	RA47XX08	4	pread47		pbird3	bird3	yes	
	I0058	RA48XX10	2	pread48		pbird5	bird5	yes	
	I0059	RA49XX06	3	pread49		pbird1	bird1	yes	
	I0060	RA54XX12	3	pread54		pisland2	island2	yes	
	I0061	RA55XX11	1	pread55		pisland1	island1	yes	
	I0062	RA56XX14	4	pread56		pisland4	island4	yes	
	I0063	RA57XX13	2	pread57		pisland3	island3	yes	
Section C	I0064	RA160304	2	pread16	tread03	ptembo4	tembo4		
	I0065	RA170405	2	pread17	tread04	ptembo5	tembo5		
	I0066	RA180524	1	pread18	tread05	pmaria1	maria1	yes	
	I0067	RA190625	2	pread19	tread06	pmaria2	maria2	yes	
	I0068	RA200726	4	pread20	tread07	pmaria3	maria3	yes	
	I0069	RA651456	1	pread65	tread14	ptree1	tree1	yes	
	I0070	RA661557	1	pread66	tread15	ptree2	tree2	yes	
	I0071	RA671658	1	pread67	tread16	ptree3	tree3	yes	
	I0072	RA691860	2	pread69	tread18	ptree5	tree5	yes	
	I0073	RA1501XX	2	pread15	tread01				
Section D	I0074	RA2108XX	3	pread21	tread08				
	I0075	RA5031XX	1	pread50	tread31				
	I0076	RA5132XX	3	pread51	tread32				
	I0077	RA5233XX	3	pread52	tread33				
	I0078	RA5334XX	1	pread53	tread34				
	I0079	RA6035XX	2	pread60	tread35			yes	
	I0080	RA6817XX	3	pread68	tread17				
	I0081	RA7741XX	4	pread77	tread41				
	I0082	RA7843XX	1	pread78	tread43				
	I0083	RA7944XX	2	pread79	tread44				
Section E	I0084	RAXX02XX	3		tread02				
	I0085	RAXX09XX	4		tread09				
	I0086	RAXX13XX	1		tread13				
	I0087	RAXX19XX	2		tread19				yes
	I0088	RAXX20XX	3		tread20				yes
	I0089	RAXX21XX	2		tread21				yes
	I0090	RAXX22XX	2		tread22				yes
	I0091	RAXX23XX	2		tread23				
	I0092	RAXX24XX	3		tread24				yes
	I0093	RAXX25XX	1		tread25				

Section	RUMM VarName	SPSS VarName	KEY	S2P	S2T	S1P	Zim91	IEA Pop1	IEA Pop2
	I0094	RAXX26XX	4		tread26				
	I0095	RAXX27XX	2		tread27				
	I0096	RAXX28XX	2		tread28				
	I0097	RAXX29XX	2		tread29				
	I0098	RAXX30XX	1		tread30				
	I0099	RAXX36XX	3		tread36			yes	
	I0100	RAXX37XX	2		tread37			yes	
	I0101	RAXX38XX	4		tread38				
	I0102	RAXX39XX	3		tread39				
	I0103	RAXX40XX	3		tread40				
	I0104	RAXX42XX	2		tread42				
	I0105	RAXX45XX	3		tread45				
	I0106	RAXX46XX	1		tread46				
	I0107	RAXX47XX	1		tread47				
	I0108	RAXX48XX	1		tread48				
	I0109	RAXX49XX	3		tread49				
Section F	I0110	RAXX1027	1		tread10	pquick1	quick1	yes	
	I0111	RAXX1128	4		tread11	pquick2	quick2	yes	
	I0112	RAXX1229	3		tread12	pquick3	quick3	yes	
Section G	I0113	RAXXXX01	4			ptembo1			
	I0114	RAXXXX02	3			ptembo2			
	I0115	RAXXXX03	4			ptembo3			
	I0116	RAXXXX07	3			pbird2		yes	
	I0117	RAXXXX09	3			pbird4		yes	
	I0118	RAXXXX15	4			pjoseph1	joseph1		
	I0119	RAXXXX16	4			pjoseph2	joseph2		
	I0120	RAXXXX17	1			pjoseph3	joseph3		
	I0121	RAXXXX18	2			pjoseph4	joseph4		
	I0122	RAXXXX19	4			pjoseph5			
	I0123	RAXXXX30	4			pempty1	bottles1	yes	
	I0124	RAXXXX31	3			pempty2	bottles2	yes	
	I0125	RAXXXX32	4			pempty3	bottles3	yes	
	I0126	RAXXXX33	1			pempty4	bottles4	yes	
	I0127	RAXXXX34	3			pcarrot1	carrots1		
	I0128	RAXXXX35	4			pcarrot2	carrots2		
	I0129	RAXXXX36	1			pcarrot3	carrots3		
	I0130	RAXXXX37	1			pcarrot4	carrots4		
	I0131	RAXXXX38	4			pcarrot5	carrots5		
	I0132	RAXXXX39	2			ptempra1	temper1		
	I0133	RAXXXX41	2			ptempra3	temper3		
	I0134	RAXXXX42	4			ptempra4	temper4		
	I0135	RAXXXX43	2			ptempra5	temper5		
	I0136	RAXXXX44	3			pmaize1			
	I0137	RAXXXX45	3			pmaize2			
	I0138	RAXXXX46	3			pmaize3			
	I0139	RAXXXX47	2			pmaize4			
	I0140	RAXXXX48	3			pmaize5			
	I0141	RAXXXX49	1			pmaize6			
	I0142	RAXXXX50	3			pgrandp1			

Section	RUMM VarName	SPSS VarName	KEY	S2P	S2T	S1P	Zim91	IEA Pop1	IEA Pop2
	I0143	RAXXXX51	4			pgrandp2			
	I0144	RAXXXX52	2			pgrandp3			
	I0145	RAXXXX53	3			pgrandp4			
	I0146	RAXXXX54	4			pgrandp5			
	I0147	RAXXXX55	3			pgrandp6			
	I0148	RAXXXX59	1			ptree4			

Appendix G

The 91 Test Items (and their Sources) that were Used in the “Hypothetical Test” for Calibrating the Mathematics Test Items

Section	RUMM VarName	SPSS VarName	KEY	S2P	S2T	TIMSS Pop1	TIMSS Pop2
Section A	I0001	MA01XX	2	pmath01			
	I0002	MA02XX	2	pmath02			
	I0003	MA03XX	3	pmath03			
	I0004	MA04XX	2	pmath04			
	I0005	MA05XX	2	pmath05			
	I0006	MA06XX	3	pmath06			
	I0007	MA07XX	4	pmath07			
	I0008	MA08XX	2	pmath08			
	I0009	MA09XX	2	pmath09			
	I0010	MA10XX	4	pmath10			
	I0011	MA11XX	1	pmath11			
	I0012	MA12XX	3	pmath12			
	I0013	MA13XX	2	pmath13			
	I0014	MA14XX	4	pmath14			
	I0015	MA15XX	3	pmath15			
	I0016	MA16XX	2	pmath16			
	I0017	MA17XX	2	pmath17			
	I0018	MA18XX	2	pmath18			
	I0019	MA19XX	1	pmath19			
	I0020	MA20XX	1	pmath20			
	I0021	MA21XX	2	pmath21			
	I0022	MA22XX	1	pmath22			
	I0023	MA23XX	3	pmath23			
	I0024	MA24XX	2	pmath24			
	I0025	MA25XX	2	pmath25			
	I0026	MA31XX	2	pmath31			
	I0027	MA34XX	3	pmath34			
	I0028	MA35XX	2	pmath35			
	I0029	MA36XX	2	pmath36			
	I0030	MA37XX	2	pmath37			
	I0031	MA38XX	1	pmath38			
	I0032	MA39XX	3	pmath39			
	I0033	MA40XX	2	pmath40			
	I0034	MA41XX	4	pmath41			
	I0035	MA42XX	1	pmath42			
	I0036	MA43XX	4	pmath43			
	I0037	MA45XX	3	pmath45			
	I0038	MA46XX	3	pmath46			
	I0039	MA47XX	2	pmath47			L-10
	I0040	MA48XX	2	pmath48			
	I0041	MA49XX	1	pmath49			
	I0042	MA50XX	2	pmath50			P-17
	I0043	MA51XX	3	pmath51			

Section	RUMM VarName	SPSS VarName	KEY	S2P	S2T	TIMSS Pop1	TIMSS Pop2
	I0044	MA52XX	3	pmath52			
	I0045	MA53XX	2	pmath53			
	I0046	MA54XX	3	pmath54			
	I0047	MA59XX	1	pmath59			
	I0048	MA60XX	2	pmath60			
	I0049	MA61XX	3	pmath61			
	I0050	MA62XX	1	pmath62			
Section B	I0051	MA2616	2	pmath26	tmath16		
	I0052	MA2701	4	pmath27	tmath01	I-3	
	I0053	MA2803	1	pmath28	tmath03	I-8	
	I0054	MA2905	3	pmath29	tmath05	K-6	
	I0055	MA3007	3	pmath30	tmath07	L-5	
	I0056	MA3212	3	pmath32	tmath12		
	I0057	MA3315	2	pmath33	tmath15		
	I0058	MA4411	2	pmath44	tmath11		
	I0059	MA5514	2	pmath55	tmath14		
	I0060	MA5602	4	pmath56	tmath02	I-7	
	I0061	MA5706	3	pmath57	tmath06	K-9	
	I0062	MA5833	1	pmath58	tmath33		
	I0063	MA6328	1	pmath63	tmath28		N-17
Section C	I0064	MAXX04	2		tmath04	I-9	R-12
	I0065	MAXX08	3		tmath08		
	I0066	MAXX09	4		tmath09		P-8
	I0067	MAXX10	4		tmath10		
	I0068	MAXX13	3		tmath13		
	I0069	MAXX17	3		tmath17		I-8
	I0070	MAXX18	4		tmath18		J-14
	I0071	MAXX19	2		tmath19		J-18
	I0072	MAXX20	2		tmath20		K-4
	I0073	MAXX21	2		tmath21		
	I0074	MAXX22	2		tmath22		K-6
	I0075	MAXX23	3		tmath23		L-11
	I0076	MAXX24	2		tmath24		K-8
	I0077	MAXX25	1		tmath25		L-14
	I0078	MAXX26	2		tmath26		L-17
	I0079	MAXX27	3		tmath27		M-6
	I0080	MAXX29	2		tmath29		Q-1
	I0081	MAXX30	2		tmath30		R-7
	I0082	MAXX31	4		tmath31		R-9
	I0083	MAXX32	3		tmath32		S-2
	I0084	MAXX34	3		tmath34		V-3
	I0085	MAXX35	3		tmath35		
	I0086	MAXX36	3		tmath36		
	I0087	MAXX37	3		tmath37		
	I0088	MAXX38	3		tmath38		
	I0089	MAXX39	2		tmath39		
	I0090	MAXX40	3		tmath40		
	I0091	MAXX41	3		tmath41		

Appendix H

Example Test Items for Each Level of Competence in Reading

Level 1: Pre Reading (Linked with Level 1 in the Test Blueprint)

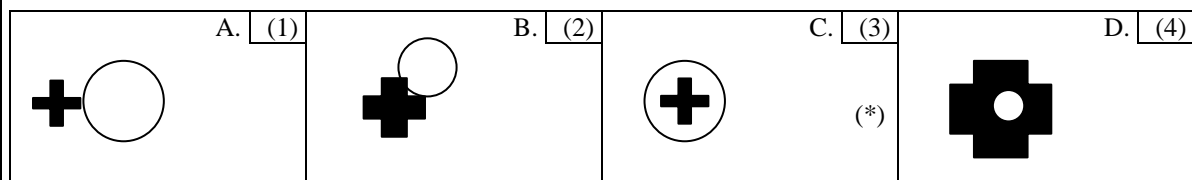
(a) Skills: Matches words and pictures involving concrete concepts and everyday objects.
Follows short simple written instructions.

(b) Example Test Items

- locate familiar words in a short (one line) text
- match words to pictures
- follow short and familiar instructions

In the questions on this page, choose the diagram that matches the word or sentences.

2. This cross is inside the circle.



Source: SACMEQ II Pupil Test.

Rasch Difficulty: -1.895

Comment: In this item the pupil needs to match the words “cross” and “circle” with the two items in each diagram – and then match the word “inside” with the diagram that illustrates the meaning of the word.

Level 2: Emergent Reading (Linked with Level 2 in the Test Blueprint)

(a) Skills: Matches words and pictures involving prepositions and abstract concepts; uses cuing systems (by sounding out, using simple sentence structure, and familiar words) to interpret phrases by reading on.

(b) Example Test Items

- read familiar words and identify some new words
- use simple and familiar prepositions and verbs to interpret new words
- match words and very simple phrases

The Indian Tailor Bird

One of the most interesting birds I have seen is the Indian Tailor Bird. It is a small olive green bird that doesn't look at all unusual, yet it has a most unusual way of making its nest. The birds work together in pairs. First they find a leaf, the right size, and make holes along the edges with their beaks. Through these holes they thread grass. One bird pushes the thread from the outside, while the other bird sits in the nest and pushes it back until the edges of the leaf are sewn together to make a kind of bag, still hanging on the tree, in which the Tailor Bird lays its eggs.

50. What does the Tailor Bird use in place of thread?

- A. ☐ (1) Grass (*)
- B. ☐ (2) String
- C. ☐ (3) Spider web
- D. ☐ (4) Thorns

Source: SACMEQ II Pupil Test and SACMEQ II Teacher Test.

Rasch Difficulty: -1.634

Comment: In this item the words "thread" and "grass" are adjacent in both the question and in the text. The pupil needs to match a word in the question to a word in the text and then use the text immediately adjacent to it by reading on - but only within a very restricted range of text. The skill involved is essentially a word matching skill.

Level 3: Basic Reading (Linked with Level 3 in the Test Blueprint)

(a) Skills: Interprets meaning (by matching words and phrases, completing a sentence, or matching adjacent words) in a short and simple text by reading on or reading back.

(b) Example Test Items

- use context and simple sentence structure to match words and short phrases
- use phrases within sentences as units of meaning

- locate adjacent words and information in a sentence

The Bird And The Elephant

A large tree grew in the middle of the jungle. At the top, a small bird had made a nest for her family of three baby birds. One day, an elephant came by. He leaned against the trunk, and scratched his back. The tree started to crack and sway. The baby birds, full of fear, huddled against their mother. She stuck the tip of her beak out of the nest, and said: "Hey, big animal, there are many trees around here! Why shake this one? My children are afraid, and could fall out of their nest."

The elephant said nothing, but he looked at the bird with his small eye, flapped his large ears in the wind, and left.

The next day, the elephant returned and scratched against the trunk once more. The tree began to sway. The frightened baby birds once again huddled against their mother's wings. Now Mother Bird was angry. "I order you to stop shaking our tree," she cried, "or I will teach you a lesson!"

"What could you do to a giant like me?" laughed the elephant. "If I wanted to, I could give such a push to this tree that your nest and your children would be flung far and wide."

The mother bird said nothing.

The next day, the elephant returned and scratched again. Quick as a flash, the mother bird flew into one of the elephant's enormous ears, and there, tickled the elephant by scratching him with her feet. The elephant shook his head ... nothing happened. So he begged the bird to leave and promised to stop scratching against the trunk.

The bird then left the elephant's ear and returned to her nest, beside her children.

Never again did the elephant return to scratch his back.

45. Where exactly did the large tree grow?

- A. ☐ ₍₁₎ In the thick jungle
- B. ☐ ₍₂₎ In the forest
- C. ☐ ₍₃₎ In the middle of the jungle (*)
- D. ☐ In the garden

Source: SACMEQ II Pupil Test.

Rasch Difficulty: -1.049

Comment: This item is similar to those in the previous level - but in this instance the pupil needs to first match phrases, and then locate the adjacent phrase by reading on in the text.

Appendix H (Ctd.)

Level 4: Reading for Meaning (Linked with Level 4 in the Test Blueprint)

(a) Skills: Reads on or reads back in order to link and interpret information located in various parts of the text.

(b) Example Test Items

- interpret sentence and paragraph level texts
- match phrases across sentences
- read forwards and backwards in order to locate information in longer texts

Grandpa

Once upon a time, there was a very old man. His eyes had become weak. His ears were deaf, and his knees would shake. When he sat at the table, he was hardly able to hold the spoon. He spilled soup on the tablecloth, and he often slobbered.

He lived with his son and daughter-in-law. They also had a small boy who was four years old, so the old man was a grandfather.

His son and his son's wife found it disgusting to see him spilling food at the table. And so they finally ordered him to sit in a corner behind the stove. Here, they served him his food on a small earthenware plate. Now, Grandpa didn't even get enough to satisfy his hunger. He sat there feeling sad. He looked at the table, where the others were eating, and his eyes filled with tears.

Then, one day his shaking hands could not even hold the plate. It fell to the floor, and was broken into many pieces. The young wife scolded him. But the old grandfather said nothing. He just sighed. Then the young wife bought him a very cheap wooden bowl. Now he had to eat from that.

One day, while they were having dinner, the grandchild sat on the floor, and was very busy with some small pieces of wood.

"What are you doing?" asked his father.

"I am making a bowl," the boy answered.

"What is it for?"

"It is for my father and mother to eat from when I grow up."

The man and wife looked at each other for a long time. Then, they started crying. At once, they asked the old grandpa back to the table, and from then on he always ate with them. After that, even if he sometimes spilt his food, they never said a word about it.

54. How did grandfather feel when he sat by the stove?

- A. ☐ (1) Bored.
- B. ☐ (2) Tired.
- C. ☐ (3) Pleased.
- D. ☐ Unhappy (*)

Source: SACMEQ I Pupil Test

Rasch Difficulty: -0.544

Comment: In this item the pupil needs to be able to read on and read back once the key idea is located in the text. The pupil needs to read for meaning and then to link and interpret information from various parts of the text - not simply adjacent to the central idea of the task.

Appendix H (Ctd.)

Level 5: Interpretive Reading (Linked with Level 5 in the Test Blueprint)

(a) Skills: Reads on and reads back in order to combine and interpret information from various parts of the text in association with external information (based on recalled factual knowledge) that “completes” and contextualizes meaning.

(b) Example Test Items

- locate, interpret, and read forward to join two pieces of adjacent information
- use multiple pieces of information to interpret general purpose of a document
- paraphrase and interpret a single non-adjacent piece of information

Read the following passage and then answer the questions below.

What Is Quicksand?

Quicksand is a special kind of sand. Quicksand can swallow a pig, or a human, or an elephant.

Quicksand often looks like plain wet sand. But it is really soupy sand with so much water between the grains that you can't stand on it.

If you step onto quicksand, you will slowly sink up to your knees. If you thrash and squirm, you will sink deeper and deeper. But, if you lie flat on your back with your arms stretched out, you can float on the sand, as you can float in water.

Watch out for quicksand on sand bars, on the bottom of streams, or along sandy seacoasts.

You can test for quicksand by poking it with a long stick or pole. If the sand shakes and quakes, don't try to walk on it! It may be quicksand.

10. What is the main purpose of the passage?

- A. ☐ (1) *To tell people how to avoid the dangers of quicksand. (*)*
- B. ☐ (2) *To encourage people to protect the beauty of nature.*
- C. ☐ (3) *To describe how people and animals have been swallowed by quicksand.*
- D. ☐ (4) *To explain how quicksand got its name.*

Source: SACMEQ I Pupil Test and SACMEQ II Teacher Test.

Rasch Difficulty: 0.073

Comment: The pupils need to read on and read back in order to combine and interpret information from different parts of the text – and then use this to interpret the general purpose of the document.

Appendix H (Ctd.)

Level 6: Inferential Reading (Linked with Level 5 in the Test Blueprint)

(a) Skills: Reads on and reads back through longer texts (narrative, document or expository) in order to combine information from various parts of the text so as to infer the writer's purpose.

(b) Example Test Items

- interpret, and make inferences from, different types of texts by reading backwards and forwards to confirm links between widely separated information pieces
- extract information from a non-traditional (left to right) document
- make judgments about an author's intentions or purpose beyond the text content

Photography

Read the comic strip and then answer the questions below.



72. Why should you take the lens cap off?

- A. ☐ (1) To let a lot of light into the camera.
- B. ☐ (2) So that it doesn't get in the way of the aperture. (*)
- C. ☐ (3) To move the camera closer to you.
- D. ☐ So the camera will be quiet.

Source: SACMEQ II Pupil Test.

Rasch Difficulty: 0.453

Comment: The pupil needs to examine and interpret information related to different pictures and words in a non-traditional (comic strip) instructional document, and then make a judgement about the purpose of a particular instruction made by the author.

Level 7: Analytical Reading (Linked with Level 5 in the Test Blueprint)

(a) Skills: locates information in longer texts (narrative, document or expository) by reading on and reading back in order to combine information from various parts of the text so as to infer the writer's personal beliefs (value systems, prejudices, and/or biases).

(b) Example Test Items

- combine several pieces of information from a range of locations in complex and lexically dense text or documents
- analyse detailed text or extended documents for an underlying message
- identify meaning from different styles of writing

Vacancy

Read the following advertisement and then answer the questions below.

Vacancy - Job opportunity
Post - Clerical Assistant

A vacancy exists for the post of a clerical assistant
in a large farm located in Mbwewe.

Qualifications:

The applicant,

- Should be a female of between 20 and 25 years of age;
- Must have successfully completed Primary 6;
- Should be fluent in either of the following languages: Kiswahili, English, or Portuguese;
- She must have a minimum work experience of three years in clerical duties.

Application should be sent to:

The General Manager
Mbwewe Farm
P.O. Box 70
Mbwewe

The deadline for application is 15 October 1999.

50. The job opportunity is for ...

- A. (1) a female clerk.
- B. (2) the general manager.
- C. (3) a large pineapple farm.
- D. (4) a clerical assistant. (*)

Source: SACMEQ II Teacher Test.

Rasch Difficulty: 1.348

Comment: In this item the pupil needs to read on and read back in order to combine information from various parts of a document, and then to decide upon the kind of person that the writer has in mind for the position.

Level 8: Critical Reading (A New Level Generated from the Skills Audit)

(a) Skills: Locates information in a longer texts (narrative, document or expository) by reading on and reading back in order to combine information from various parts of the text so as to infer and evaluate what the writer has assumed about both the topic and the characteristics of the reader – such as age, knowledge, and personal beliefs (value systems, prejudices, and/or biases).

(b) Example Test Items

- use text structure and organisation to identify an author's assumptions and purposes
- identify an author's motives, biases, beliefs in order to understand the main theme
- link text to establish multiple meanings including analogy and allegory

Effective Thinking

Effective thinking, while starting with logic, goes further so as to include broad mental skills. It includes the understanding of complex and fluid situations, in dealing with which logical methods are inadequate as mental tools. Of course, thinking must never violate the rules of logic, but it may use techniques beyond those of exact mathematical reasoning. In the fields of social study and history, and in the problems of daily life, there are large areas where evidence is incomplete and may never be completed. Sometimes the evidence may also be untrustworthy; but if the situation is practical, a decision must be made. The scientist has been habituated to deal with properties which can be abstracted from their total background and with variables which are few and well defined. Consequently, where the facts are unique and unpredictable, where the variables are numerous and their interactions too complicated for precise calculation, the scientist is apt to throw up his hands in despair and perhaps turn the situation over to the sentimentalists or the mystics. But surely he would be wrong to ignore both this type of problem and this type of thinking; for the methods of logical thinking do not exhaust the resources of reason. In coping with complex and fluid situations we need thinking which is relational and which searches for cross bearings between areas; this is thinking in a context. By its use it is possible to reach an understanding of historical and social materials and of human relations, although not with the same degree of precision as in the case of simpler materials and recurring events. As Aristotle says, "It is the mark of an educated man to expect no more exactness than the subject permits."

46. The author believes scientists should widen their field of work by undertaking problems that are ...

- A. ☐ (1) less specific and less precise. (*)
- B. ☐ (2) more exact.
- C. ☐ (3) more abstract.
- D. ☐ (4) less complex and fluid.

Source: SACMEQ II Teacher Test

Rasch Difficulty: 3.372

Comment: In this task the pupil needs to read through the entire passage, to locate information relevant to scientists' thinking processes, and to distinguish this from alternative thinking styles. Then the pupil needs to identify the beliefs of the author by inference.

Appendix I

Example Test Items for Each Level of Competence in Mathematics

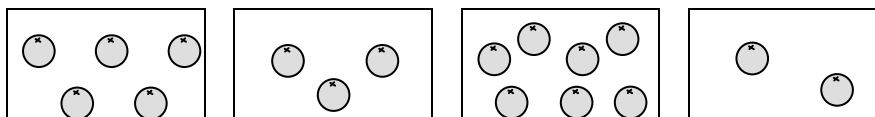
Level 1: Pre Numeracy (Linked with Level 1 in the Test Blueprint)

(a) Skills: Applies single step addition or subtraction operations. Recognizes simple shapes. Matches numbers and pictures. Counts in whole numbers.

(b) Example Test Items

- count illustrated objects
- recognise basic numbers and shapes
- carry out simple single operations of addition and subtraction

1. Which box has 7 oranges? Tick the correct box.



A. ☐ (1) B. ☐ (2) C. ☐ (3) (*) D. ☐ (4)

3. $73 + 27 =$

- A. ☐ (1) 46
B. ☐ (2) 90
C. ☐ (3) 100 (*)
D. ☐ (4) 110

Source: Both from SACMEQ II Pupil Test.

Rasch Difficulty: -4.584 and -2.717

Comment: In the first item the pupil needs to match the numeral with the picture representing the same number. This skill represents the ability to count and recognise numerical representations. In the second item the pupil needs to demonstrate the ability to perform a simple single arithmetic operation.

Appendix I (Ctd.)

Level 2: Emergent Numeracy (Linked with Level 1 in the Test Blueprint)

(a) Skills: Applies a two-step addition or subtraction operation involving carrying, checking (through very basic estimation), or conversion of pictures to numbers. Estimates the length of familiar objects. Recognizes common two-dimensional shapes.

(b) Example Test Items

- link simple verbal, graphic, and number forms with single arithmetic operations on whole numbers up to four digits
- recognise common shapes or figures in two dimensions
- estimate accurately lengths of simple shapes

4. Subtract ...

$$\begin{array}{r} 6,000 \\ - 2,369 \\ \hline \end{array}$$

- A. ☐ ₍₁₎ 3,531
- B. ☐ ₍₂₎ 3,631 (*)
- C. ☐ ₍₃₎ 3,742
- D. ☐ ₍₄₎ 4,369

Source: SACMEQ II Pupil Test and SACMEQ II Teacher Test.

Rasch Difficulty: -2.043

Comment: The pupil needs to perform the task of subtraction - with carrying.

Level 3: Basic Numeracy (Linked with Level 2 in the Test Blueprint)

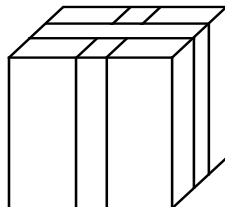
(a) Skills: Translates verbal information presented in a sentence, simple graph or table using one arithmetic operation in several repeated steps. Translates graphical information into fractions. Interprets place value of whole numbers up to thousands. Interprets simple common everyday units of measurement.

(b) Example Test Items

- recognise three-dimensional shapes and number units
- use a single arithmetic operation in two or more steps

- convert in single step units using division

40. *What shape is this present?*



- A. ☐ ₍₁₎ sphere
- B. ☐ ₍₂₎ cube (*)
- C. ☐ ₍₃₎ cylinder
- D. ☐ ₍₄₎ pyramid

Source: SACMEQ II Pupil Test.

Rasch Difficulty: -1.26

Comment: The pupil needs to know the names of 3 dimensional regular shaped objects, and then to be able to link them to everyday objects (for example, gifts).

Level 4: Beginning Numeracy (Linked with Level 3 in the Test Blueprint)

(a) Skills: Translates verbal or graphic information into simple arithmetic problems. Uses multiple different arithmetic operations (in the correct order) on whole numbers, fractions, and/or decimals.

(b) Example Test Items

- convert units in two steps and count tabulated data
- analyse a visual prompt and interpret triangular shapes
- translate verbal to arithmetic form using two operations on fractions

11. A cake was shared among four pupils as follows: John gets $\frac{1}{2}$, Peter gets $\frac{1}{8}$, Sarah gets $\frac{1}{4}$ and Janet gets $\frac{1}{16}$. Who gets the largest share?

A. <input type="checkbox"/> (1)	<i>John (*)</i>
B. <input type="checkbox"/> (2)	<i>Janet</i>
C. <input type="checkbox"/> (3)	<i>Sarah</i>
D. <input type="checkbox"/> (4)	<i>Peter</i>

Source: SACMEQ II Pupil Test

Rasch Difficulty: -0.356

Comment: The pupil needs to translate the verbal description of a problem into an arithmetic problem – and then use several operations with fractions to obtain an answer.

Level 5: Competent Numeracy (Linked with Level 3 in the Test Blueprint)

(a) Skills: Translates verbal, graphic, or tabular information into an arithmetic form in order to solve a given problem. Solves multiple-operation problems (using the correct order of arithmetic operations) involving everyday units of measurement and/or whole and mixed numbers. Converts basic measurement units from one level of measurement to another (for example, metres to centimetres).

(b) Example Test Items

- convert basic measurement units
- understand the order of magnitude of simple fractions
- conduct multiple steps with a range of basic operations in a strict sequence using an analysis of a short verbal or visual prompt.

37. On a trip a bus driver keeps a record of how far he travels each day and the time taken. Here is the first part of his record. How far did the driver most likely travel on Day 3?

Day	Distance travelled (km)	Time taken (hours)
1	42	6
2	63	9
3		8
4	49	7

- A. ☐ (1) 23 km
- B. ☐ (2) 56 km (*)
- C. ☐ (3) 64 km
- D. ☐ (4) 84 km

Source: SACMEQ II Pupil Test and SACMEQ II Teacher Test.

Rasch Difficulty: -0.024

Comment: The pupil needs to translate tabular information into an arithmetic form and then solve the problem using multiple steps and multiple arithmetic operations in the correct sequence.

Level 6: Mathematically Skilled (Linked with Level 4 in the Test Blueprint)

(a) Skills: Solves multiple-operation problems (using the correct order of arithmetic operations) involving fractions, ratios, and decimals. Translates verbal and graphic representation information into symbolic, algebraic, and equation form in order to solve a given mathematical problem. Checks and estimates answers using external knowledge (not provided within the problem).

(b) Example Test Items

- perform complex and detailed mathematical tasks (involving considerable abstraction of verbal, visual, and tabular information into symbolic forms and algebraic solutions) using knowledge not supplied with the task
- use of an extended verbal or graphic prompt (involving an analysis of steps) to identify the correct sequence of calculations
- convert, and operate on, units of measurement (time, distance, and weight)

The chart below shows some temperature readings made at different times on four days. Use the chart to answer questions 47 to 50.

	6 a.m.	9 a.m.	12 noon	3 p.m.	8 p.m.
Monday	15°C	17°C	20°C	21°C	19°C
Tuesday	15°C	15°C	15°C	10°C	9°C
Wednesday	8°C	10°C	14°C	13°C	15°C
Thursday	8°C	11°C	14°C	17°C	20°C

49. What was the average temperature on Wednesday?

- A. ☐ (1) 12° C (*)
- B. ☐ (2) 13° C
- C. ☐ (3) 14° C
- D. ☐ (4) 15° C

Source: SACMEQ II Pupil Test.

Rasch Difficulty: 0.710

Comment: The pupil needs to identify appropriate information expressed as temperatures in tabular form, and then to convert this into numbers, and then translate these into an arithmetic form in order to solve a problem.

Level 7: Concrete Problem Solving (Linked with Level 5 in the Test Blueprint)

(a) Skills: Extracts and converts (for example, with respect to measurement units) information from tables, charts, visual and symbolic presentations in order to identify, and then solves multi-step problems.

(b) Example Test Items

- use multiple verbal order of steps with conversion of time units
- translate verbal to arithmetic form, apply units conversion with long division
- convert from mixed number fractions to decimals

24. The table shows the values of x and y , where x is proportional to y . What are the values of P and Q ?

x	3	6	P
y	7	Q	35

- A. (1) $P=15$ and $Q=14$ (*)
- B. (2) $P=14$ and $Q=31$
- C. (3) $P=10$ and $Q=14$
- D. (4) $P=14$ and $Q=15$

Source: SACMEQ II Teacher Test.

Rasch Difficulty: 1.573

Comment: The pupil needs to extract information from several places in a table of figures and then apply proportionate calculations in order to solve a multi-step problem involving fractions and conversions into whole numbers.

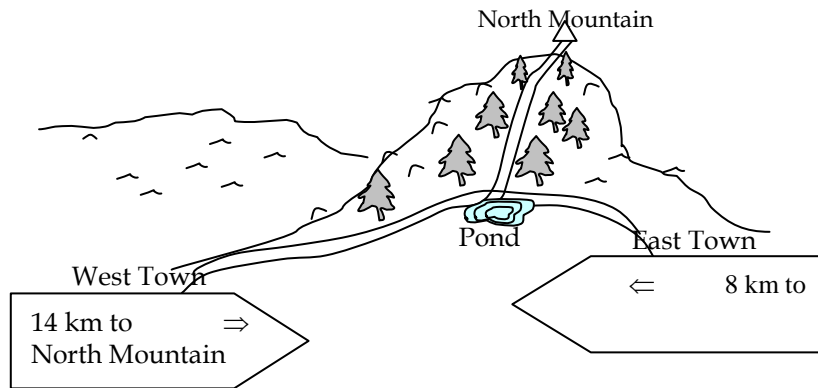
Level 8: Abstract Problem Solving (A New Level Generated from the Skills Audit)

(a) Skills: Identifies the nature of an unstated mathematical problem embedded within verbal or graphic information, and then translate this into symbolic, algebraic, or equation form in order to solve the problem.

(b) Example Test Items

- identify the nature of a problem, translate the information given into a mathematical approach, and then identify the correct mathematical strategies to obtain a solution a solution

35. There are two ways to go to North Mountain. One is from East Town and the other is from West Town. The distance from East Town to the pond in the map below is $\frac{1}{3}$ of the distance from West Town to the pond. What is the distance from West Town to the pond?



- A. (1) 7 km
B. (2) 8 km
C. (3) 9 km (*)
D. (4) 10 km

Source: SACMEQ II Teachers Test.

Rasch Difficulty: 1.934

Comment: The pupil needs to translate the information given into a form of mathematical thinking and then search for a solution strategy. The pupil needs to link the unknown distances to variables and then solve simultaneous equations. The key skills are the identification of the problem, its translation into a symbolic form, and the solution of the equations.