

## CHAPTER 7

# TEACHING CONTEXTS IN MOZAMBIQUE AND SACMEQ COUNTRIES

### INTRODUCTION

This chapter firstly presents the Mozambican and regional internal teaching context. The internal teaching context is defined in terms of the availability of sitting/writing places, a teacher's table, a teacher's chair, bookshelves and classroom equipment such as a chalkboard, a dictionary, maps, a book corner, and teacher guides. Thereafter, the chapter presents the Mozambican and regional external teaching context, which is defined in terms of education resources, the condition of buildings, number of classes and pupils, tuition and leadership. In both of these parts of the chapter, the regional comparisons are taken from data collected in the SACMEQ II study.

### 7.1 THE INTERNAL TEACHING CONTEXT IN MOZAMBIQUE

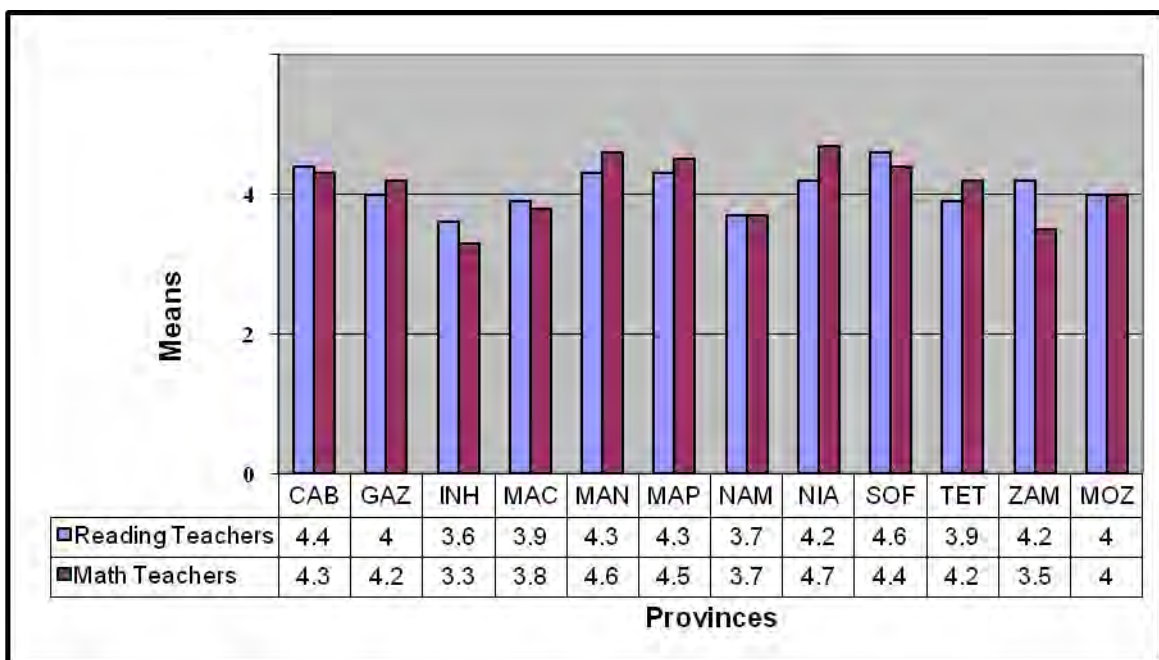
There are many internal and external factors which affect teacher and pupil performance at schools. In Mozambican schools, in general, the internal teaching context plays a major role in educational achievement, and one of the challenges for the Ministry of Education and Culture (MEC) is to address these challenges. The following section presents and discusses the internal teaching context in Mozambique.

#### 7.1.1 Availability of Classroom Resources

Questions were asked about classroom furniture such as the teachers' chair, the teachers' table, desks, a usable writing board, chalk, a wall chart of any kind, a cupboard, one or more bookshelves, and a classroom library or book corner. School equipment and school materials are seen to be an essential part of instruction. Besides teacher competence, one of the factors that may influence teacher and pupil performance is the physical environment, which includes variables such as the arrangement of the classroom, equipment and materials, the number of pupils and the seating patterns. In primary education, school conditions and resources are closely related to performance in reading and mathematics.

Most reading and mathematics teachers in Mozambique respectively had usable writing boards (98%, 97%), chalk (96%, 94%), teacher tables (71%, 70%) and teacher chairs (71%, 69%) (see Appendix 14).

Figure 7.1 shows the availability of classroom resources in the country by provinces. An index was formed where the number of items was combined. The minimum value is one, which means that the school did not have any of the listed items, and the maximum is 8, which means that the school had all of the items (see Appendix 15 for more details).



Source: Passos, Nahara, Magaia and Lauchande, 2005, p.52

Figure 7.1 Mean for classroom resources index

The results summarized in Figure 7.1 show that, on average, pupils had access to four out of eight items for both reading and mathematics, and there was little variation among provinces. The variations in mean ranged from 3.6 in Inhambane to 4.6 in Sofala for reading teachers. With mathematics teachers, the variation in mean ranged from 3.3 in Inhambane to 4.7 in Niassa. By any standard, this level of provision is less than adequate and requires the attention of the Ministry of Education and Culture.

Sitting and writing places are an essential part of classroom equipment. Table 7.1 shows the percentages of pupils that had sitting and writing places.

Table 7.1

*Percentages and sampling errors for pupils having sitting and writing places*

Region	% Having sitting place		% Having writing place	
	%	SE	%	SE
Cabo Delgado	46.5	11.46	39.3	10.35
Gaza	49.9	11.31	46.1	10.70
Inhambane	34.5	11.64	33.8	11.60
Maputo Cidade	94.8	3.36	89.0	3.63
Manica	97.9	0.88	91.6	2.16
Maputo Provincia	95.6	3.28	89.6	3.64
Nampula	34.2	9.55	32.1	9.13
Niassa	84.4	7.87	72.3	8.22
Sofala	90.0	5.18	76.4	6.55
Tete	97.6	0.95	85.8	3.72
Zambézia	65.9	9.73	62.1	9.89
<b>Mozambique</b>	<b>71.5</b>	<b>2.66</b>	<b>65.8</b>	<b>2.64</b>

Source: Passos, Nahara, Magaia and Lauchande, 2005, p.53

The results of the analysis summarized in Table 7.1 show that, for the country as a whole, almost a third (30%) of Grade 6 pupils were without sitting places and a little more than a third (35%) of Grade 6 pupils were without writing places. The variation among the regions was quite large. In Manica only 2% of the Grade 6 pupils had no chair, while in Nampula 66% of Grade 6 pupils were without a chair.

The problem is aggravated when it comes to the provision of writing places, but it follows the same general pattern across regions. Manica is the region where more than 8% have no place, while in Nampula only 68% of pupils had no writing places.

### **Textbooks**

A further important factor that makes a difference in pupil performance is the supply of textbooks to pupils. Table 7.2 shows the percentages of pupils having their own reading and mathematics textbooks.

Table 7.2

*Percentages and sampling errors for pupils having own reading and mathematics textbooks*

Region	Own reading textbook		Own mathematics textbook	
	%	SE	%	SE
Cabo Delgado	44.6	6.35	45.5	6.80
Gaza	44.0	8.62	47.6	8.77
Inhambane	40.8	8.28	58.2	9.34
Maputo Cidade	57.9	4.70	63.4	4.85
Manica	68.3	5.18	73.2	4.87
Maputo Provincia	48.9	7.19	48.7	7.11
Nampula	44.1	6.28	50.8	6.40
Niassa	39.1	7.53	41.4	6.79
Sofala	57.8	3.49	66.1	3.87
Tete	73.0	6.70	74.1	6.43
Zambézia	62.8	4.28	62.7	4.39
<b>Mozambique</b>	<b>53.2</b>	<b>1.99</b>	<b>58.3</b>	<b>2.03</b>

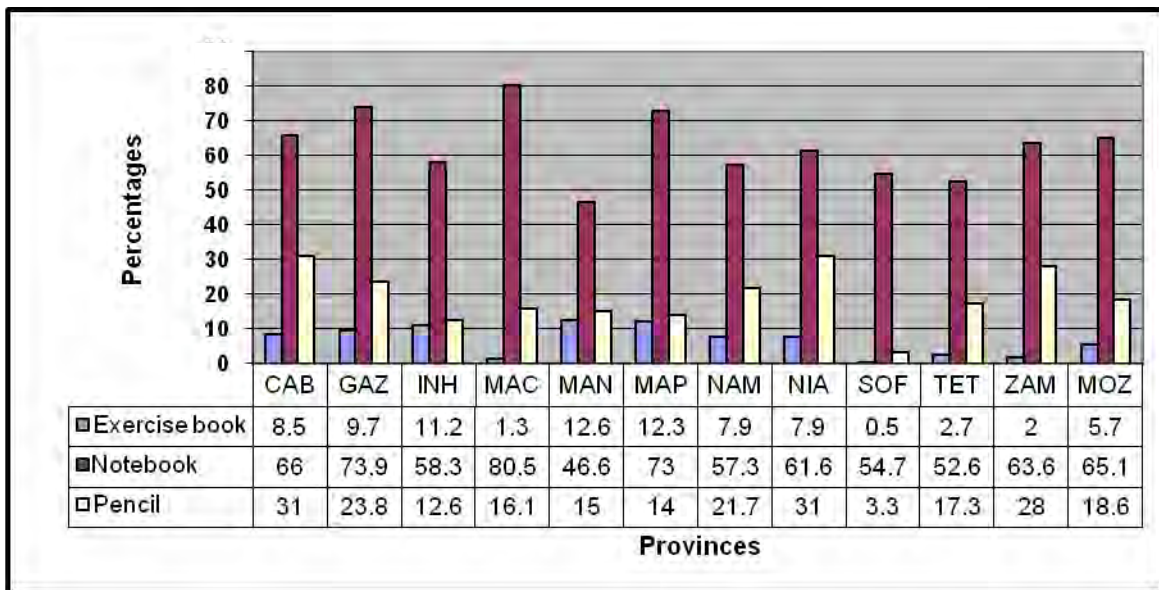
Source: Passos, Nahara, Magaia and Lauchande, 2005, p.49

As seen in Table 7.2, more than half of the Grade 6 pupils had their own reading (53%) and mathematics (58%) textbooks. There were some variations between provinces. Tete had the best supply, with nearly three quarters of all Grade 6 pupils having their own reading (73%) and mathematics (74%) textbooks. Niassa had the lowest percentage of Grade 6 pupils with their own reading (39%) and mathematics (41%) textbooks.

Another reason for the shortage of textbooks in the schools is related to the distribution system itself. When the MEC introduced the new curriculum in 2004, not all pupils received the textbooks, not even in larger towns like Maputo Cidade and in the provincial capitals where there are no apparent problems of access to schools for the distribution of books. The results show that in Maputo Cidade only 60% and 63% of pupils had their own reading and mathematics textbooks respectively.

### Stationery

Pupils were asked questions about being equipped with basic classroom materials, namely exercise books, notebooks, pencils, erasers, pens and rulers. Figure 7.2 presents the percentages of pupils who did not have these items (see Appendix 16 for more information).



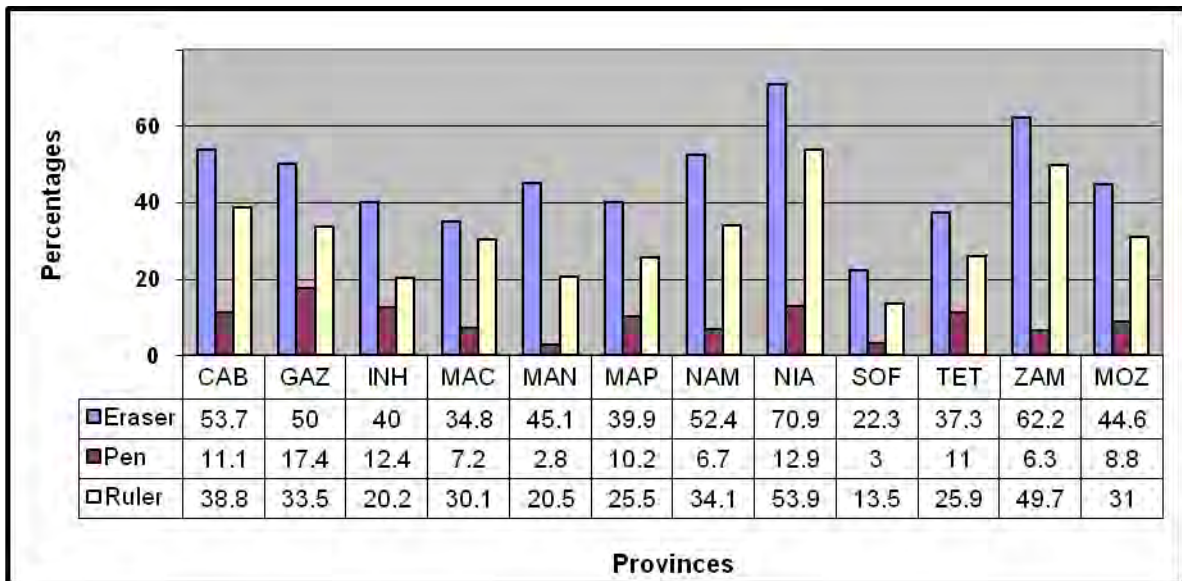
Source: Passos, Nahara, Magaia and Lauchande, 2005, p.50

Figure 7.2 Percentages of Mozambican pupils who did not have any basic classroom materials: Exercise book, notebook and pencil

Most Mozambican pupils use exercise books for writing their work at school. A factor which could have been considered in the apparent high percentage of pupils that did not have notebooks (as can be seen in Figure 7.2) but it seems that exercise books were used in preference to notebooks in Mozambique. Sofala province presents the lowest percentage (1%) of pupils that did not have exercise books. Inhambane, Manica and Maputo Province are among the provinces with the highest percentage of pupils that did not have exercise books: 11%, 13% and 12% respectively. In addition, 19% of pupils in the country did not have their own pencil, with large variations among provinces, ranging from 3% in Sofala to 31% in Niassa.

Taking into consideration the shortage of textbooks, the exercise books and pencils are essential for pupils to take notes or to record the lessons. A shortage of a combination of all of items could contribute to low pupil performance. However, in Mozambique it seems that most pupils are equipped with the basic stationery.

Figure 7.3 shows the percentage of pupils who did not have basic classroom materials such as erasers, pens, and rulers (see Appendix 17).



Source: Passos, Nahara, Magaia and Lauchande, 2005, p.50

*Figure 7.3* Percentages of Mozambican pupils who do not have basic classroom materials: Eraser, pen, and ruler

Figure 7.3 shows that for all materials mentioned above, the eraser was the item which about 45% of pupils did not possess, and the ruler was also in short supply with 31% of pupils not having one. There were large variations among provinces. For example, 22% of the pupils in Sofala did not have an eraser, and neither did 71% of the pupils in Niassa. Also, 3% of pupils in Manica did not have a pen, and neither did 13% of the pupils in Niassa. On average across the country, 9% of the pupils did not have a pen. There were also variations in ownership of different items in the same province. For example, 14% of the pupils in Zambézia did not have an eraser while 50% of those same pupils did not have a ruler. Generally speaking, Sofala had the lowest percentage of pupils in Grade 6 without the basic classroom materials and Niassa had the highest number of pupils in Grade 6 who did not have basic classroom materials.

The results of the analysis summarised in Figures 7.2 and 7.3 above show that there was a general lack of basic classroom materials which are to be supplied by parents and not by the Ministries of Education to the Grade 6 pupils. This inability to provide their children with basic classroom equipment such as a pen, pencil, eraser and ruler could be a reflection of the parents' low socio-economic conditions. Such a deficit of basic equipment has implications for the effectiveness of education.



## 7.2 THE INTERNAL TEACHING CONTEXT IN SACMEQ COUNTRIES

This section presents and discusses the internal teaching context in Mozambique as compared with other SACMEQ countries.

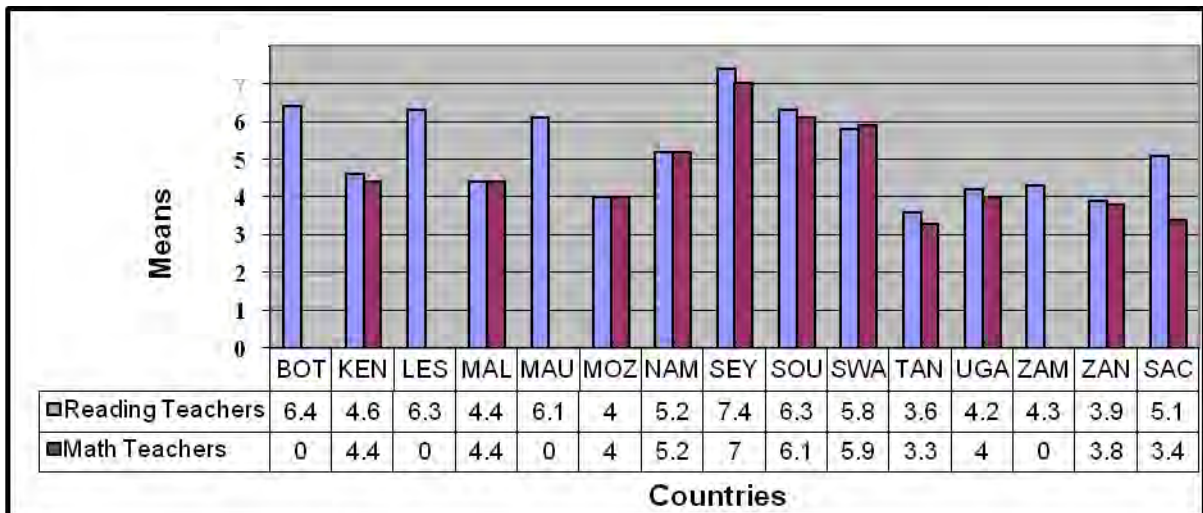
### 7.2.1 Availability of Classroom Furniture

Teachers were asked questions about classroom furniture, as referred to previously in this chapter. The information summarized in Appendices 16 shows the availability of classroom resources in the SACMEQ countries. The resources comprise basic items such as a usable writing board (94% and 94%), chalk (95% and 93%), one or more bookshelves (9% and 7%), a teacher's table (71% and 66%), a teacher's chair (73% and 68%) and a wall chart of some kind (65% and 61%), for reading and mathematics teachers respectively. Less than half of the classrooms had cupboards (46% and 39%) and a classroom library or book corner (45% and 28%) for reading and mathematics teachers respectively. Only 29% and 25% respectively of classrooms had one or more bookshelves for use by reading and mathematics teachers.

There were large variations among the countries in the SACMEQ II study in terms of classroom resources (8 items). For instance, the percentage of classrooms that had wall charts of any kind ranged from 18% in Mozambique to 97% in Seychelles for reading teachers, while the percentage of classrooms that had cupboards ranged from 8% in Zanzibar to 92% in Seychelles. The percentage of classrooms that had one or more sets of bookshelves ranged from 6% in Zanzibar to 95% in Seychelles, whereas of classrooms with a classroom library or book corner, the percentages ranged from 7% in Tanzania to 81% in Kenya. The resources available to mathematics teachers in these countries followed the same patterns as those available to reading teachers (see Appendix 18 for more information).

In general, Seychelles had more classroom resources than other countries in the SACMEQ II study. The difference among countries in terms of the resources allocated to classrooms may be related to the level of income in each country. Seychelles reports high percentages of classroom resources and is also the country which had the highest Gross National Income (GNI) per capita of the countries in the SACMEQ II study (see Figure 7.7).

Figure 7.4 shows the means and sampling errors for the classroom resources index (SACMEQ II). As in the previous example, the minimum value is one, which means that the school does not have any of the listed items (see Appendix 14), and the maximum is 8, which means that the school has all of the 8 items (see Appendix 19).



Source: Data from SACMEQ II database, 2004

Figure 7.4 Means for the SACMEQ classroom resources index

Figure 7.4 indicates that there was balance in each country in terms of the distribution of classroom resources among mathematics and reading teachers. The countries with more resources in the classroom were the countries whose national income was highest (GDP), namely Seychelles, Mauritius, Botswana, and South Africa. Other countries, such as Swaziland, Lesotho, Kenya, Zambia, Uganda, Tanzania, Mozambique and Malawi have lower national incomes and a correspondingly lower availability of classroom resources.

Table 7.3 indicates the percentage of pupils that had writing places and sitting places, which are considered important factors in classroom resources.



Table 7.3

*Percentages and sampling errors for SACMEQ pupils having sitting and writing places*

Country	% Having sitting place		% Having writing place	
	%	SE	%	SE
Botswana	100	0.00	100	0.00
Kenya	99.2	0.21	96.1	0.76
Lesotho	99.9	0.08	97.4	1.30
Malawi	56.4	4.39	54.5	4.32
Mauritius	100	0.00	100	0.00
Mozambique	71.5	2.66	65.8	2.64
Namibia	97.4	1.03	95.9	1.18
Seychelles	100	0.00	100	0.00
South Africa	98.1	0.58	96.4	0.70
Swaziland	99.4	0.30	99.0	0.28
Tanzania	96.5	0.64	95.4	0.72
Uganda	89.5	1.70	74.5	2.46
Zambia	92.5	1.25	88.8	1.49
Zanzibar	54.6	0.69	52.1	0.76
<b>SACMEQ</b>	<b>89.6</b>		<b>86.8</b>	

Source: Data from SACMEQ II database, 2004

There were on average 90% and 87% of Grade 6 pupils with writing places and sitting places respectively. The variation among the countries was quite large. In Botswana, Mauritius and Seychelles all Grade 6 pupils had sitting places and writing places while in Malawi 56% had a sitting place and 52% of pupils in Zanzibar had a writing place. In all SACMEQ countries, pupils in Grade 6 had more sitting places than writing places.

Another factor that makes a difference to teacher and pupil performance is the supply of pupils' textbooks. Table 7.4 presents the percentage of pupils who have their own reading and mathematics textbooks.

Table 7.4

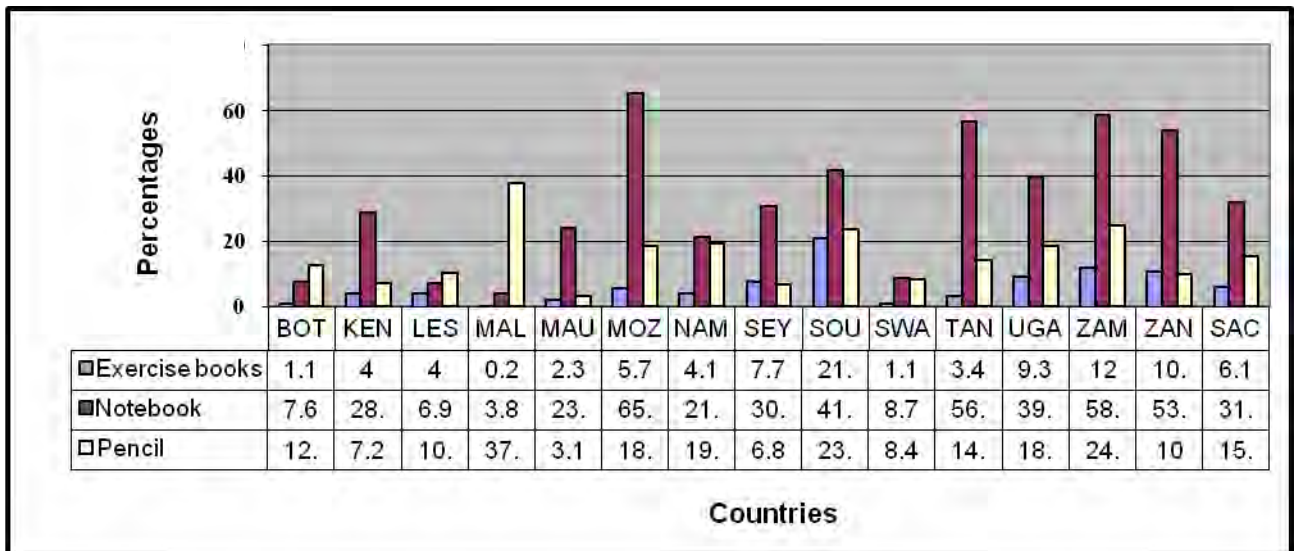
*Percentages and sampling errors for SACMEQ pupils who have own reading and mathematics textbooks*

COUNTRY	Own reading textbook		Own mathematics textbook	
	%	SE	%	SE
Botswana	77.4	1.82	80.0	1.77
Kenya	26.8	2.63	23.4	2.48
Lesotho	55.3	2.81	45.6	2.89
Malawi	57.0	4.12	56.5	4.13
Mauritius	91.5	1.58	95.9	0.99
Mozambique	53.2	1.99	58.3	2.03
Namibia	46.6	1.99	48.3	2.23
Seychelles	46.9	1.21	75.6	1.05
South Africa	45.5	2.82	41.0	3.01
Swaziland	74.3	2.87	74.7	3.40
Tanzania	6.0	0.56	6.8	0.67
Uganda	14.7	1.26	12.2	1.11
Zambia	14.2	1.50	12.7	1.66
Zanzibar	3.8	0.34	5.1	0.35
<b>SACMEQ</b>	<b>46.2</b>		<b>45.4</b>	

Source: Data from SACMEQ II database, 2004

As seen in Table 7.4, on average 46% and 45% of Grade 6 pupils had their own reading and mathematics textbooks respectively. There was wide variation between countries. Mauritius had the best supply at 92% and 96% in reading and mathematics books respectively. And Zanzibar had the lowest supply at 4% and 5% of all Grade 6 pupils having reading and mathematics textbooks respectively. In spite of the low supply of the reading and mathematics textbooks, Kenya recorded high performances in reading and in mathematics tests, as will be shown in the next chapter. Uganda (15% and 12%), Zambia (14% and 13%), Tanzania (6% and 7%) and Zanzibar (4% and 5%) had a poor supply of reading and mathematics textbooks in their schools.

Figure 7.5 summarises the percentage of pupils who did not have the basic materials: exercise books, notebooks and pencils (see Appendix 20).

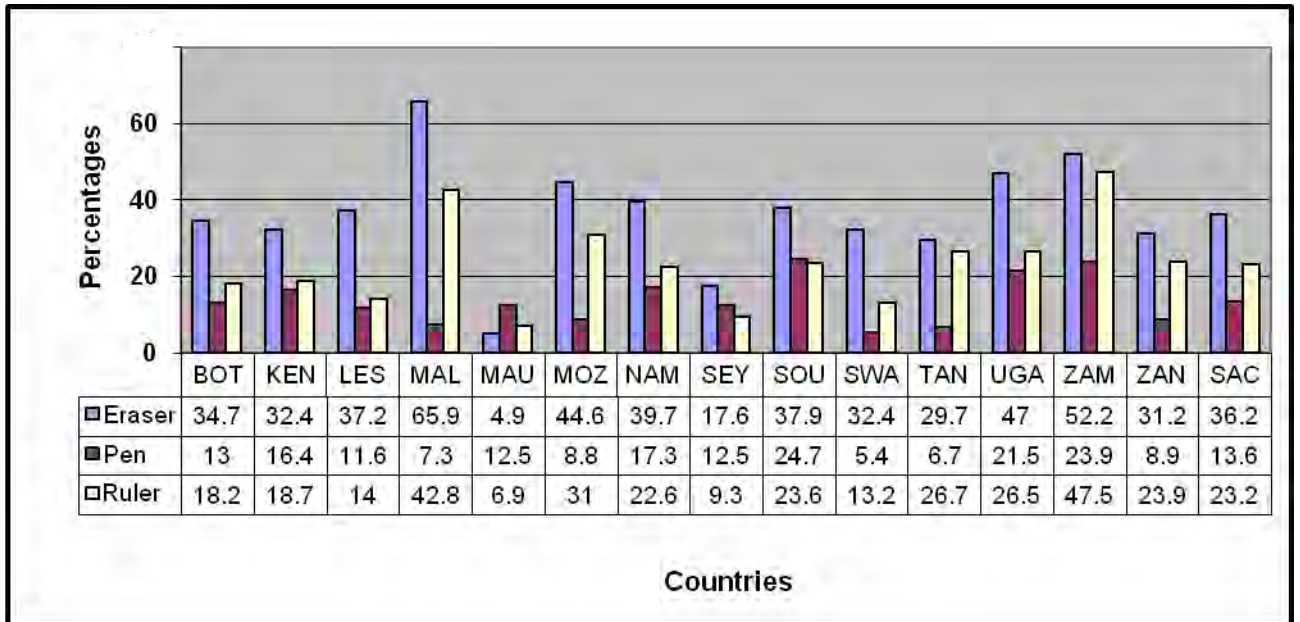


Source: Data from SACMEQ II database, 2004

*Figure 7.5* Percentage for the SACMEQ shortages of basic classroom materials: exercise books, notebooks and pencils

As seen in Figure 7.5, a small minority (6%) of pupils in the SACMEQ II countries did not have exercise books. However, 32% of the pupils did not have notebooks while 15% did not have pencils. There was some variation between countries, ranging from less than 1% in Malawi to 21% in South Africa for exercise books, and from 3% in Mauritius to 38% of pupils in Malawi who did not have pencils. There was a large variation in the shortage of notebooks, which ranged from 4% in Malawi to 65% in Mozambique of pupils who did not have notebooks. In South Africa, 21%, 42% and 24% of pupils did not have exercise books, notebooks and pencils respectively.

In addition to the above shortages of classroom materials, Figure 7.6 presents the percentage of pupils without basic classroom materials such as an eraser, a pen and a ruler (see Appendix 21).



Source: Data from SACMEQ II database, 2004

Figure 7.6 Percentage of SACMEQ pupils without basic classroom materials: eraser, pen, and ruler

Figure 7.6 shows that on average in the SACMEQ II countries, 36% of pupils did not have an eraser, and 23% of pupils did not have a ruler. Only 14% of pupils in all of the SACMEQ countries did not have pens. There was a large variation among countries, ranging from 5% in Mauritius to 66% of the pupils in Malawi, who did not have erasers, and from 5% in Swaziland to 25% of pupils in South Africa who did not have pens. In the case of rulers, the variation ranged from 7% in Mauritius to 48% of pupils in Zambia that did not have rulers. In Zambia 52%, 24% and 48% of pupils did not have erasers, pens and rulers respectively. Generally speaking, Mauritius presents the lowest percentage of pupils in Grade 6 who did not have the basic classroom materials.

### 7.3 EXTERNAL TEACHING CONTEXT IN MOZAMBIQUE

The next section presents and discusses the external teaching context in Mozambique, addressing in particular school buildings, school grounds, and general services and equipment.

#### 7.3.1 School Resources

Table 7.5 shows the percentages and sampling errors for four categories of general facilities. The four categories, school buildings, school grounds, general services, and equipment were combined by SACMEQ to give a mean of the total school resources.

Table 7.5

*Percentages and sampling errors for schools with general facilities in Mozambique*

Facility	Percentage for facilities	
	%	SE
<b>School buildings</b>		
School library	27.2	3.13
School hall	8.7	2.12
Staff room	54.6	3.91
School director's office	81.8	3.24
Store room	47.1	3.95
Cafeteria	48.0	3.02
<b>School grounds</b>		
Sports area/ playground	62.9	3.77
School garden	35.9	3.71
<b>General services</b>		
Piped water/well or borehole	59.0	3.42
Electricity	58.5	3.33
Telephone	44.7	2.97
<b>Equipment</b>		
First-aid kit	8.7	1.79
Fax machine	2.4	1.05
Typewriter	80.3	2.89
Duplicator	34.0	3.11
Radio	11.0	2.02
Tape recorder	2.6	0.75
Overhead projector	1.6	0.33
Television set	2.6	1.02
Video-cassette recorder	1.4	1.01
Photocopier	4.4	1.57
Computer	10.6	2.18

Source: SACMEQ II database, 2004

The analysis summarised in Table 7.5 shows that overall there was a lack of general facilities. For example, in terms of school buildings, only 27% of the schools had a library, 55% had a staff room, and 82% of the schools had a designated school director's office. Less than half of the schools had storerooms (47%) and a cafeteria (48%), and in addition, only 63% of the schools had a sports area or playground for their pupils. A small percentage (36%) of the schools had a school garden.

Basic services were also lacking, with only 59% of the schools having piped water, just over half (59%) having electricity, and only 45% having access to a telephone. In terms of equipment, the majority of the schools (80%) had a typewriter, with only 34% being equipped with a duplicator.

There were variations the number of resources that each school had, ranging from just over 1% for a video-cassette recorder to 11% of the schools with a radio.

*It is clear that, given the current economic development status of the country, it is difficult to provide the schools with all of the general facilities described. However, it would be important to select some of the basic items the Ministry of Education can supply. For instance, facilities such as piped water, electricity, and a school library should be regarded as basic facilities that each school must have. Other facilities that should be regarded as essential, such as the first aid kit and school garden, also reflect very low levels of provision. This should be a matter of concern to the Ministry (Passos, Nahara, Magaia and Lauchande, 2005, p.43).*

Table 7.6 presents the mean and sampling errors for total school resources in Mozambique.

Table 7.6

*Mean and sampling errors for total school resources*

Region	Total school resources	
	Mean	SE
CAB	7.3	0.5
GAZ	5.3	0.7
INH	3.6	0.9
MAC	10.7	0.6
MAN	6.1	0.8
MAP	9.1	0.7
NAM	4.4	0.6
NIA	6.5	0.5
SOF	9.0	1.1
TET	6.0	0.5
ZAM	5.6	0.5
<b>Mozambique</b>	<b>6.9</b>	<b>0.2</b>

Source: SACMEQ II database, 2004

As can be seen from Table 7.6, Mozambique had a mean of nearly 7 out of 22 for total school resources. Maputo Cidade had the highest mean (11) of school resources, and was followed in decreasing order by Maputo Provincia (9), Sofala (9), Cabo Delgado (7); then by Niassa (7) and Tete (6). The mean of school resources in the rest of the provinces was lower than 6.



### 7.3.2 Tuition

It is common practice in many countries for pupils to regularly take extra classes organized by teachers or other people. These classes may be free or paid for and they may be at school or out of school. There are many reasons for taking extra tuitions classes, but most are related to the need to improve achievement. The SACMEQ II study asked questions about extra tuition and the results are presented in Table 7.7.

Table 7.7

*Percentages and sampling errors for the extra tuition taken by pupils outside school hours with details of payment*

Provinces	Extra tuition on any subject		There is Payment		There is no payment		Don't know	
	%	SE	%	SE	%	SE	%	SE
<b>Cabo Delgado</b>	90.1	3.88	13.9	2.54	73.1	2.41	13.0	1.98
<b>Gaza</b>	68.4	5.84	28.6	4.06	55.5	4.94	15.9	3.64
<b>Inhambane</b>	68.6	8.22	23.3	6.08	54.0	5.05	22.7	5.81
<b>Maputo Cidade</b>	53.2	5.65	35.9	3.99	57.5	4.00	6.7	1.57
<b>Manica</b>	78.6	3.39	14.2	2.90	61.7	4.17	24.0	3.82
<b>Maputo Prov.</b>	61.6	7.77	25.1	5.09	63.4	4.95	11.5	2.46
<b>Nampula</b>	67.9	6.42	18.1	2.95	67.6	4.73	14.3	3.47
<b>Niassa</b>	79.9	4.03	34.3	4.16	55.7	4.27	10.0	2.34
<b>Sofala</b>	77.0	3.25	39.5	4.65	49.5	3.95	11.1	2.67
<b>Tete</b>	74.7	6.43	28.5	4.14	55.2	3.08	16.3	3.26
<b>Zambézia</b>	57.9	7.30	27.2	4.19	61.3	3.04	11.6	3.04
<b>Mozambique</b>	<b>66.5</b>	<b>2.10</b>	<b>26.9</b>	<b>1.29</b>	<b>59.2</b>	<b>1.36</b>	<b>13.9</b>	<b>1.02</b>

Source: SACMEQ II database, 2004

As indicated in Table 7.7, two-thirds (67%) of Grade 6 pupils in Mozambique answered that they have extra tuition in any subject. There were large variations among provinces, ranging from 90% in Cabo Delgado to 53% in Maputo Cidade. The low percentage of pupils that had extra tuition in Maputo Cidade may be indicative of the large number of pupils who attend private schools. It appears that free tuition is often offered by family, relatives or friends, while evidence of payment for extra tuition by professionals is mostly found in urban areas.

As stated before, there was no tradition of extra tuition in Mozambique, but because of the increasing importance of the need to attain high grades, 67% of Mozambican pupils have extra tuition, of which 27% is paid for 59% of pupils made no payment, while 14% did not know if their parents paid or not. The variation among provinces for pupils who paid for extra tuition ranged

from 14% in Cabo Delgado to 40% in Sofala. The percentage of pupils who did not pay for extra tuition varied from 73% in Cabo Delgado to 50% in Sofala, while for those that did not know, the variation ranged from 7% in Maputo Cidade to 24% in Manica.

### 7.3.3 Leadership

One of the tasks of the school director is to supervise teacher activities. Table 7.8 shows the percentages and sampling errors for the frequency of advice to a teacher from a school head.

Table 7.8

*Percentages and sampling errors for the frequency of advice to a teacher from a school head*

Provinces	Percentage of teachers receiving advice 'sometimes' or 'often'			
	Reading teachers		Mathematics teachers	
	%	SE	%	SE
<b>Cabo Delgado</b>	100	0.00	100	0.00
<b>Gaza</b>	95.4	4.66	93.4	6.62
<b>Inhambane</b>	100	0.00	100	0.00
<b>Maputo Cidade</b>	96.5	0.27	99.0	0.39
<b>Manica</b>	100	0.00	100	0.00
<b>Maputo Provincia</b>	100	0.00	88.3	8.46
<b>Nampula</b>	89.2	5.04	90.3	4.04
<b>Niassa</b>	97.5	2.51	100	0.00
<b>Sofala</b>	96.9	3.10	97.6	1.37
<b>Tete</b>	87.5	6.99	100	0.00
<b>Zambézia</b>	81.5	7.15	80.9	5.88
<b>Mozambique</b>	<b>94.3</b>		<b>94.6</b>	

Source: SACMEQ II database, 2004

Table 7.8 shows that the majority of teachers (94% of reading teachers and 95% of mathematics teachers) generally receive advice sometimes or often from the school head. All reading and mathematics teachers in Cabo Delgado, Manica and Inhambane reported that they had received advice sometime or often from their school heads. The variation among provinces ranged from 100% in the provinces mentioned above to 82% and 81% in Zambézia with reading and mathematics respectively. Only in Maputo Província the reading teachers (100%) received advice more often than the mathematics teachers (88%).

Table 7.9 shows the importance of various school director tasks which involve activities with school staff and the greater community.

Table 7.9

*The importance of various school director tasks*

Task	Percentage rating as 'very important'	
	%	SE
Contact with community	84.1	2.51
Monitoring pupil progress	87.5	2.68
Administrative tasks	92.0	2.77
Discuss educational objectives with the teaching staff	94.2	1.62
Professional development (Teachers)	89.0	2.40
Professional development (School directors)	69.2	3.85

Source: SACMEQ II database, 2004

The item “discuss educational objectives with the teaching staff” was reported as the most important (94%), followed in decreasing order by “administrative tasks” (92%), “professional development of teachers” (89%), “monitoring pupil progress” (88%) and “contact with community” (84%), and the least important was the “professional development of School directors” (69%).

## 7.4 EXTERNAL TEACHING CONTEXT IN SACMEQ COUNTRIES

This section presents and discusses the external teaching context in Mozambique in comparison with schools in other SACMEQ countries.

### 7.4.1 School Resources

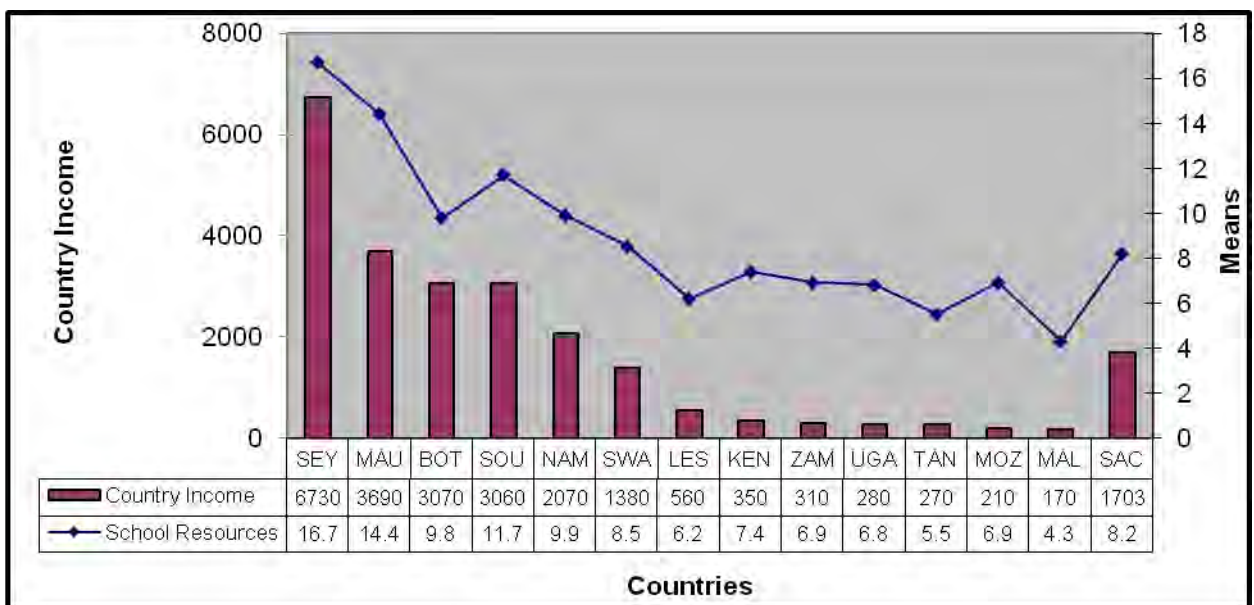
School resources found in the SACMEQ countries is presented and discussed, evaluating particularly the school buildings, school grounds, general services and equipment. Table 20 in the appendices presents the percentages and sampling errors for schools with general facilities in SACMEQ.

The majority of the schools (81%) had a sports area, which was followed in decreasing order of prevalence by piped water/a well or borehole (79%), an office for the school head (73%), a school garden (68), a storeroom (61%) and a staff room (60%). The rest of the items occurred in fewer

than half of the schools, with the least frequent item being an overhead projector, which was found in only 8% of the schools. In spite of the vital role that a school library plays in both the teacher’s and the pupils’ academic lives, only 46% of the schools in SACMEQ countries had school libraries. In the Appendix 22, the highlighted numbers shows the variation among countries. Generally, Seychelles was the country with more school facilities in 2000, and Malawi the country with fewer school facilities, particularly the technological equipment. Seychelles was the country with the highest (GNI USD 6730) and Malawi the lowest (GNI USD 170) income among SACMEQ countries. There may be a relation between this fact and the provision of school facilities (see Figure 7.7).

Owing to the varying levels of economic development in SACMEQ countries, it is very difficult to provide all schools with the facilities described in the list. As in the case of Mozambique, it is necessary to define some priorities such as the provision of piped water, which is vital for school sanitation and pupils’ hygiene, of electricity, of a school library, a first-aid kit and a typewriter. However, only Seychelles and Mauritius had water and electricity in all of their schools.

Figure 7.7 shows the relation between national income and mean for total school resources (see Appendix 23).



Source: Countries income in USD: data from Murimba and Nzomo, 2003

Source: Total school resources data from SACMEQ II database, 2004

Figure 7.7 Country income (2001) and mean for total school resources index

The information summarised in Figure 7.7 shows that, on average, the index for total school resources in the SACMEQ countries was 8.2. Seychelles had the highest mean of total school resources (16.7), and was followed in decreasing order by Mauritius (14.4), and then South Africa (11.7). In the remaining countries, the mean of total school resources was lower than the average (8.2) and the lowest was Malawi with a mean of 4.3. The variation among countries ranged from 16.7 in Seychelles to 4.3 in Malawi. It can be seen that the total school resources in SACMEQ countries followed a similar pattern to the countries' income; that is, countries with a higher income had more total school resources (Seychelles) and countries with a lower income had fewer total school resources (Mozambique and Malawi).

## 7.4.2 Tuition

Pupils were asked to indicate whether or not they participated in extra tuition outside school hours and whether they paid for it or not, and the results are reflected in Table 7.10.

Table 7.10

*Percentages and sampling errors for the extra tuition taken by pupils outside school hours, and payment*

Country	Extra tuition on any subject		There is Payment		There is no payment		Don't know	
	%	SE	%	SE	%	SE	%	SE
<b>Botswana</b>	53.2	2.47	14.7	1.21	61.4	2.07	23.9	1.60
<b>Kenya</b>	87.7	1.91	57.9	2.65	33.0	2.45	9.1	1.05
<b>Lesotho</b>	49.3	3.17	30.1	2.52	51.8	3.08	18.0	1.82
<b>Malawi</b>	79.7	3.47	8.9	1.41	9.6	1.73	81.4	2.34
<b>Mauritius</b>	86.6	1.10	90.7	1.01	8.0	0.89	1.3	0.35
<b>Mozambique</b>	66.5	2.10	26.9	1.29	59.2	1.36	13.9	1.02
<b>Namibia</b>	44.7	2.33	17.3	1.42	39.6	2.37	43.1	2.08
<b>Seychelles</b>	47.7	1.23	25.1	1.58	44.0	1.74	30.9	1.69
<b>South Africa</b>	57.9	3.38	28.6	1.81	33.0	1.79	38.4	1.54
<b>Swaziland</b>	36.3	3.81	10.2	1.77	68.2	4.18	21.6	3.72
<b>Tanzania</b>	86.5	1.38	36.1	2.38	48.5	2.30	15.4	1.37
<b>Uganda</b>	81.8	2.45	51.4	1.84	33.6	1.90	15.0	1.29
<b>Zambia</b>	55.1	3.56	50.8	2.64	39.6	2.40	9.6	1.30
<b>Zanzibar</b>	55.9	0.95	38.0	1.54	24.4	1.21	37.5	1.50
<b>SACMEQ</b>	<b>63.4</b>		<b>34.7</b>		<b>39.5</b>		<b>25.6</b>	

Source: Data from SACMEQ II database, 2004

As indicated in Table 7.10, 63% of Grade 6 pupils in SACMEQ countries answered that they had extra tuition classes in a given subject. Kenya, one of the best countries in terms of pupil performance, had the highest percentage (88%) of pupils under extra tuition, while Swaziland had the lowest percentage (36%). Interestingly, Seychelles, with high pupil performance, had less than half of their pupils (48%) attending extra tuition classes outside of school hours which could indicate the higher standard of teaching and learning taking place in that country.

In relation to the payment, it is noteworthy that of the pupils in Grade 6 that received extra tuition in various school subjects, 35% paid for the lessons. Some 40% percent made no payment, while 26% of the pupils reported that they did not know if payment had been made. There was some variation between countries. The proportion of pupils who paid for extra tuition ranged from 91% in Mauritius to 9% in Malawi. This country had recorded that 80% of its pupils had extra tuition, with 81% not knowing whether their parents paid or not. Mauritius had only 1% of pupils who did know. The percentages among countries of pupils who do not pay for extra tuition ranged from 68% in Swaziland to 8% in Mauritius.

### **7.4.3 Leadership**

The frequency of advice to a teacher from a school head is presented in Table 7.11.



Table 7.11

*Percentages and sampling errors for the frequency of advice to a teacher from a SACMEQ school head*

COUNTRIES	Percentage of teachers receiving advice 'sometimes' or 'often'			
	Reading teachers		Mathematics teachers	
	%	SE	%	SE
Botswana	94.0	1.42	-	-
Kenya	98.5	0.96	97.4	1.35
Lesotho	91.4	2.13	-	-
Malawi	97.2	1.46	96.7	1.63
Mauritius	91.0	1.58	-	-
Mozambique	94.3	1.24	94.6	1.27
Namibia	88.5	2.04	85.5	2.27
Seychelles	90.7	0.61	91.3	0.57
South Africa	88.9	2.67	87.3	2.69
Swaziland	90.5	2.28	89.6	2.43
Tanzania	95.4	1.56	92.7	2.15
Uganda	97.5	1.35	98.4	1.21
Zambia	94.5	1.58	-	-
Zanzibar	95.5	0.30	92.6	0.25
<b>SACMEQ</b>	<b>93.4</b>		<b>92.6</b>	

Source: Data from SACMEQ II database, 2004

The school head is in a position to give advice to his teachers, and Table 7.11 illustrates that 93% of reading teachers and 93% of mathematics teachers receive advice “sometimes” or “often” from their school heads. There was some variation among countries, ranging from 99% in Kenya to 89% in Namibia for reading teachers, and from 98% in Uganda to 86% in Namibia for mathematics teachers. The information summarised in Table 7.11 shows that school directors do give support to the teachers if a school director is knowledgeable and can offer solid support. This ongoing professional support by the school head could overcome the shortage of support from the Ministry at district or provincial level.

The school director was asked about the importance of various activities in his school, such as contact with the community, the monitoring of pupil progress, administrative tasks, the discussing of educational objectives with teaching staff, and the professional development of both teachers and school directors. This information is summarized in the Table 7.12.

Table 7.12

*The importance of various school director tasks*

COUNTRY	Percentage rating of school director tasks as 'very important'											
	Task											
	Contact with community		Monitoring pupils progress		Administrative tasks		Discuss educational objectives with the teaching staff		Professional development (Teachers)		Professional development (School directors)	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
<b>Botswana</b>	85.1	2.83	98.2	1.17	99.3	0.68	96.8	1.43	97.4	1.28	99.3	0.72
<b>Kenya</b>	82.2	3.13	97.3	1.06	96.7	1.50	89.9	2.77	83.1	3.30	100.0	0.00
<b>Lesotho</b>	83.0	3.15	92.8	2.23	95.4	1.81	88.7	2.51	86.2	2.87	95.6	1.69
<b>Malawi</b>	80.0	3.60	97.1	1.32	96.6	1.48	87.5	2.91	88.7	2.87	97.0	1.43
<b>Mauritius</b>	75.8	3.62	89.3	2.51	97.4	1.33	86.8	2.93	86.5	2.90	97.6	1.30
<b>Mozambique</b>	84.1	2.51	87.5	2.68	92.0	2.77	94.2	1.62	89.0	2.40	69.2	3.85
<b>Namibia</b>	88.9	2.13	94.3	1.57	94.8	1.38	83.5	2.56	86.1	2.43	98.0	0.87
<b>Seychelles</b>	72.6	0.00	95.0	0.00	95.0	0.00	95.0	0.00	79.0	0.00	100.0	0.00
<b>South Africa</b>	91.5	2.32	99.4	0.63	95.8	1.83	96.2	1.49	90.5	2.40	95.2	2.14
<b>Swaziland</b>	71.1	4.21	94.5	1.72	92.3	2.02	77.0	4.07	83.3	3.08	95.7	1.86
<b>Tanzania</b>	98.5	1.06	96.9	1.47	94.0	1.88	94.0	2.03	91.3	2.36	98.6	1.03
<b>Uganda</b>	90.1	2.69	91.9	2.55	96.7	1.49	85.9	3.02	88.0	2.77	98.6	1.20
<b>Zambia</b>	86.7	2.70	95.5	1.76	89.9	2.36	87.6	2.72	83.3	3.13	96.6	1.52
<b>Zanzibar</b>	84.8	0.00	88.9	0.00	90.3	0.00	86.5	0.00	83.1	0.00	93.9	0.00
<b>SACMEQ</b>	<b>83.8</b>		<b>94.1</b>		<b>94.7</b>		<b>89.2</b>		<b>86.8</b>		<b>95.3</b>	

Source: Data from SACMEQ II database, 2004

School heads reported that all of the activities in the list were very important, but that the professional development, particularly of school directors, was the most important (95%), followed in decreasing order by administrative tasks (95%), monitoring pupil progress (94%), discussing educational objectives with the teaching staff (89%), the professional development of teachers (87%), and contact with community (84%). There was variation among countries on issues such as contact with the community, (99% in Tanzania to 71% in Swaziland), monitoring pupils' progress (99% in South Africa to 88% in Mozambique), administrative tasks (99% in Botswana to 90% in

Zambia), discussing educational objectives with teaching staff (97% in Botswana to 77% in Swaziland), the professional development of teachers (97% in Botswana to 79% in Seychelles), and the professional development of School directors (100% in Kenya and Seychelles to 69% in Mozambique). In some countries, it seemed that the school heads were more interested in their own professional development than their teachers' professional development, or even the monitoring of pupil progress. The most important activity in Mozambique was the discussion of educational objectives with the teaching staff (94%) followed by the performance of administrative tasks (92%).

## 7.5 SUMMARY

The aim of this chapter has been to describe the internal and external teaching contexts in upper primary schools in Mozambique and the other SACMEQ countries. On the one hand, this information constitutes a context for the subsequent analysis and interpretation of teacher and pupil performance presented in Chapter 8, and on the other, the teaching context can be related to teacher competence and pupil performance.

Internal factors which affect school achievement have been identified. These include factors such as poor teacher quality, poor physical inputs like school buildings, lack of classrooms, lack of writing places and other teaching equipment, lack of textbooks, insufficient student contact time, and large class sizes (Miguel and Barsaga, 1997). Some external factors, such as the socio-economic level of the family and the community, parents' moral support of their children, and parents' assessment of the importance of schooling to the child's future have also been identified (Miguel and Barsaga, 1997).

Anderson (1991) stresses the importance of the classroom environment to learning, as it influences both pupils and teachers. He points out that the classroom environment should allow for clear view and access to the teacher as well as having sufficient space to move and work comfortably in the surroundings:

*Many of the elements of physical environment mentioned in the literature as influencing those who inhabit classroom border on common sense. When the teacher is presenting information to an entire class of students, each student should have an unobstructed view of teacher or the information presented by the teacher. When students are expected to engage in a discussion with other students, the physical arrangement of the classroom should facilitate (e.g., circular arrangements) rather than inhibit (e.g., static row and column arrangements) this discussion. When*

*equipment and materials are needed, this equipment and these materials should be readily available to the students (Anderson, 1991, p.38).*

In SACMEQ countries, 90% and 87% of Grade 6 pupils had sitting and writing places, respectively, in their classrooms. The variation among countries was quite large. In Botswana, Mauritius and Seychelles all Grade 6 pupils had sitting and writing places while, in Malawi only just over half of the pupils (56%) had sitting places, and the same applied to pupils in Zanzibar, of whom (52%) had writing places. Pupils in Grade 6 in all SACMEQ countries tended to have places to sit (90%) rather than places at which to write (87%). In Mozambique 72% of the pupils had sitting places while 66% had writing places.

Grade 6 pupils in SACMEQ countries had their own reading and mathematics textbooks (46% and 45% respectively). There were large variations among countries, with Mauritius having the best supply of books at 92% and 96% in reading and in mathematics respectively. Zanzibar had the lowest supply, 4% and 5% of all Grade 6 pupils having reading and mathematics textbook respectively. In spite of a low supply of the reading and mathematics textbooks, Kenya had better performance in reading and in mathematics than other SACMEQ countries, as will be shown in the next chapter. Uganda (14% and 12%), Zambia (14% and 13%), Tanzania (6% and 7%) and Zanzibar (4% and 5%) had the worst supply of textbooks for reading and mathematics respectively. Mozambique had a 53% textbook supply for reading and 58% for mathematics.

The Mozambican policy regarding textbooks in primary education is that the books are school property. The pupils borrow the books at the beginning of the year and return them at the end of year. As illustrated in the study, the supply was insufficient as not all pupils had books, and further studies are required to investigate the obstacles in textbook provision. An aspect to take into consideration is the problem of the textbook shortage at school dates back to before the introduction of the new curriculum in 2004. The issue of the lack of textbooks in developing countries is of crucial importance to pupil performance, as is confirmed by Farrell (1989) when he stresses that children in developing countries, who have access to textbooks and other reading material, learn more than those who do not, and that the more books they have, the more they will learn.

One of the challenges for the Ministry of Education and Culture is to provide textbooks for all pupils on time. Chapter 2 of the Ministry of Education's Strategic Plan for Education (1998) states that one of the relevant changes for improving quality has been the change in textbook production with the development of the National Book Policy, which involves the private sector in the process.

This policy was expected not only to enhance the provision of books, but also to ensure that the books became more responsive to the context of education in Mozambique.

On average, total school resources in the SACMEQ countries were rated at 8.2. Seychelles had the highest mean (16.7) of total school resources, and was followed in rank order by Mauritius (14.4), South Africa (11.7) and Namibia (9.9); then by Botswana (9.8) and Swaziland (8.5). Within the remaining countries, the mean of total school resources was lower than the average (8.2), with the variation among countries ranging from 16.7 in Seychelles to 4.3 in Malawi. Mozambique had 6.9 of total school resources, and this challenge is one that the Ministry of Education and Culture will have to overcome to guarantee the provision of resources to all schools to ensure effective teaching and learning.

In relation to educational leadership in the SACMEQ countries, the percentage of teachers receiving advice from the school head “sometimes” or “often” was 93% for reading teachers and 93% for mathematics teachers. There was some variation among countries, ranging from 99% in Kenya to 86% in Namibia for reading teachers, and from 98% in Uganda to 86% in Namibia for mathematics teachers. From the information summarised it can be seen that the school directors gave support to their teachers. If the school director is well qualified and professionally developed, the lack of support from the district or provincial level can be overcome through the school director’s provision of support and advice to the teachers in his school. In Mozambique 94% of reading teachers and 95% of mathematics teachers received advice “sometimes” or “often” from the school head.

All activities cited in the questionnaire list were seen by the school directors as very important, but the professional development of school directors (95%) was considered to be the most important. This was followed in rank order by administrative tasks (95%), monitoring pupils’ progress (94%), discussing educational objectives with the teaching staff (89%), the professional development of teachers (87%) and finally contact with community (84%). In some countries, it seems that the school directors were more interested in their own professional development than in monitoring pupil progress or teacher professional development. The most important activity in Mozambique was discussing educational objectives (94%), followed by administrative tasks (92%).

The following chapter, Chapter 8, discusses teacher and pupil performance in the SACMEQ II test.

## CHAPTER 8

# TEACHER AND PUPIL PERFORMANCE IN READING AND IN MATHEMATICS IN MOZAMBIQUE AND IN SACMEQ COUNTRIES

### INTRODUCTION

Teaching contexts such as the internal and external teaching contexts in Mozambique and SACMEQ countries as well as the problems that pupils face were described in Chapter 7. The aim of this chapter is to describe teacher and pupil performance in reading and mathematics tests in Grade 6 in primary schools in Mozambique and in the other SACMEQ countries. The performance of both the teachers and the pupils was analysed per province and overall nationally for Mozambique, and then on a regional level, incorporating all SACMEQ countries. Performance was also analysed by gender, socio-economic status and school location (urban and rural). The results presented in this chapter are based partly on the Mozambican report (Passos, Nahara, Magaia and Lauchande, 2005) and partly on further analysis conducted on the data from the SACMEQ database archive (2004). These data are presented as a preliminary step in the background information for further analysis in Chapter 9.

The chapter is structured as follows: Section 8.1 provides general information on the Mozambican and the regional teacher and pupil performance in reading in the SACMEQ countries per province, at national level and for the SACMEQ region. In Section 8.2, the Mozambican and the regional pupil performance in mathematics is presented. Finally, a summary of this chapter is provided in Section 8.3.

### 8.1 TEACHER AND PUPIL PERFORMANCE IN READING IN SACMEQ II TESTS IN MOZAMBIQUE AND IN SACMEQ COUNTRIES

The next section present, analysing and discuss teacher and pupil performance in SACMEQ II tests in Mozambique and in SACMEQ countries at provincial, national and regional level.



### 8.1.1 Teacher Performance in Mozambique and in SACMEQ Countries

Teachers' subject content knowledge is one of the factors that directly affects teaching performance (Shulman, 1986) and consequently, pupil performance. For instance, even those teachers with advanced academic qualifications have to ensure that they have the subject content knowledge for primary education teaching. The importance of subject content knowledge for teacher performance was confirmed by Châu's study (1996) in which he stresses that:

One might think a priori that there should not be major problems in this regard at the primary level, given that most teachers in the countries studied have a reasonable level of education (10 to 12 years of school). But the formal level of education is not necessarily synonymous with competence. Classroom observations in the different countries show that certain teachers have an insufficient mastery of the subject matter they teach. In addition, many of them lack the pedagogical know-how required for good presentation of the material. This was particularly true in Madhya Pradesh, where most teachers have not received any specific professional training. But the same problem has also been identified in the other countries (p.86).

Therefore, besides professional training, subject knowledge plays an important role in teacher performance. Content subject matter knowledge, which includes all of the subjects that the teacher must teach, is very important for good teaching, a point which Grossman (1995) confirms by stating that "qualitative research suggests that teacher's knowledge of the content they teach affects both what teachers teach and how they teach it" (p.6118).

To measure cognitive outcomes in the SACMEQ II study, teachers and pupils in all countries, with the exception of the South African and Mauritian teachers, completed the reading and mathematics tests. Pupil and teacher performances were analysed and then categorised into eight "competence levels" in reading and mathematics. Descriptions of competency levels are presented in Table 4.4 in Chapter 4. In essence, the notion is to designate different levels of skills showing what teachers and pupils can do at each level in reading and in mathematics. Although being at one level means that teachers or pupils are ready to start the next level, they cannot, at present, successfully complete the tasks embodied at this next level.

In the SACMEQ II study, teachers were asked to answer a subject knowledge test aligned to the content of the subject area that they taught in upper primary school. The maximum score in the SACMEQ II tests for teachers was 1000. The average score of all teachers in the SACMEQ countries was 733.8 in reading with a standard deviation of 4.42, and 791.7 in mathematics with a

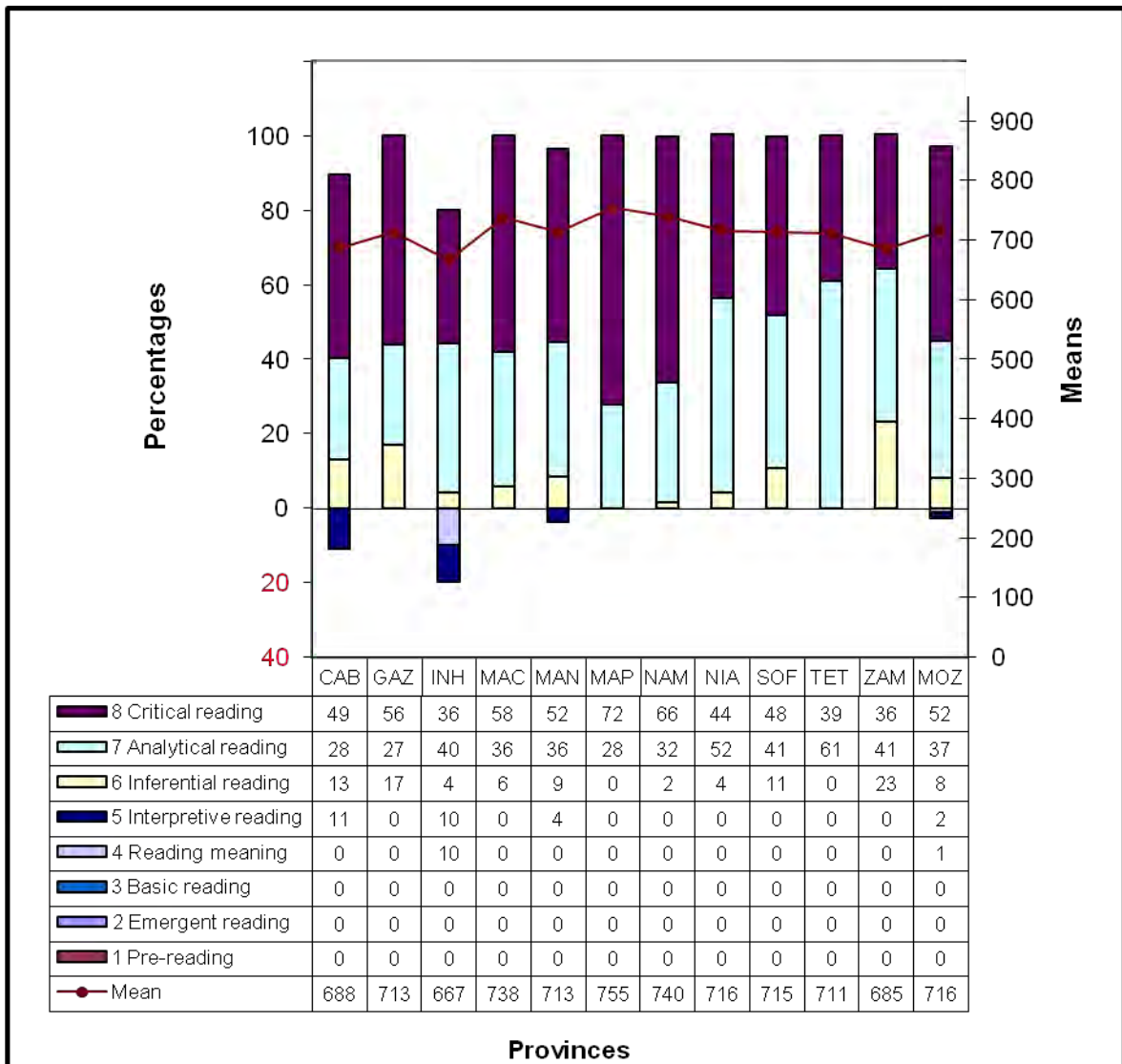
standard deviation of 6.59. Teacher performance results in reading and mathematics are presented in Figures 8.1; 8.2; 8.17 and 8.18.

In order to understand pupil performance in the SACMEQ II tests, the Mozambican teacher performance in reading and mathematics tests is presented and discussed because the level of pupil performance in the tests could be influenced by teacher ability and their own performance in literacy and numeracy.

### **Teacher performance in reading in Mozambique**

Teacher subject knowledge, as indicated previously, is one of the factors that determines teacher performance in the classroom (Shulman, 1986; Châu, 1996). Teachers are required to have a level of competence in terms of subject knowledge (Shulman, 1986) and to have attended professional training. In Mozambique, teachers are required to have only a Grade 10 academic qualification for entrance to teacher training colleges, which qualifies them to teach in lower and upper primary education over a two- or three-year period.

Figure 8.1 below shows the percentage and mean scores for the reading test completed by teachers of Grade 6 pupils in Mozambique both per province and nationally (for more details see Appendix 24 – means scores, percentages and SE). However, to facilitate the reading of the figure and others that follow, it is important to note that the figure has two axes, namely percentage, presented on the left, and the mean score on the right. The means of teacher performance are represented by a line, and the maximum is 1000. The percentage shows the performance of teachers at different designated reading and mathematics competence levels in stacked columns (see Chapter 4, Table 4.4 for a description of these levels). The ideal scenario would be to have all teachers performing at Level 8. However, because of the variation in teacher performance in the SACMEQ II tests, this information is divided into two groups separated by a performance line. One group, situated below the line, consists of teachers who performed below Level 6 in terms of their subject knowledge – levels which are deemed unacceptable in this study. The second group consists of teachers who performed up to Level 5. This group is located above the line.



Source: SACMEQ database, 2004

Figure 8.1 Percentage of teachers, mean scores and attained reading levels of Mozambican reading teachers

As the teachers’ test was similar to the pupils’ test, it was expected that the teachers’ reading skills would have been well developed and that their results would have reflected this development, showing them performing at the highest levels presented in Figure 8.1. However, the teacher average was 716.2, and when this mean is compared with the maximum score (1000), it is evident that the Mozambican teacher mean fell 283.8 below the maximum score with Maputo Província recording the highest scores (754.5) and Inhambane the lowest (666.6).

Figure 8.1 also shows the percentage of Grade 6 reading teachers who reached each of the specific levels of reading in the SACMEQ II tests as well as the percentage of teachers who performed at or

below Level 5, “interpretative reading,” which in the teaching profession is considered an unacceptable level. This 3% is of concern to the Ministry of Education, because it was expected that teachers, who are training a country’s youth, would be equipped with the highest levels of skills. Thus teachers with a mean of 716.2 from an overall possible score of 1000 can be regarded as poor performers.

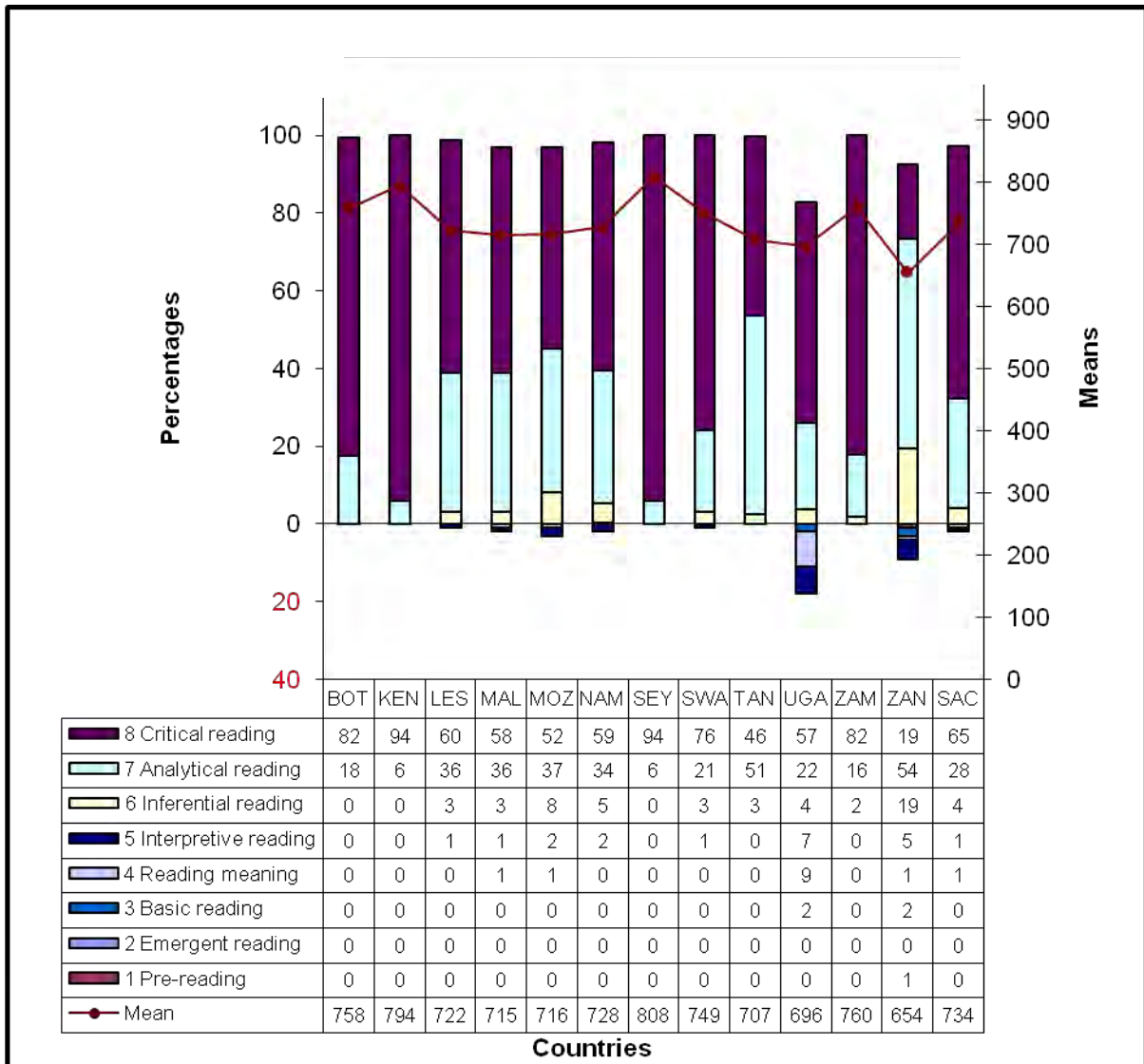
Some 4% to 11% of pupils were taught reading by teachers who performed at or below Level 5, as was the case in Cabo Delgado where 11% of the teachers performed at or below this level, Inhambane with 20% of the teachers, and Manica with 4%. However, 45% of the teachers who taught Grade 6 pupils had reached a test score at either Level 6 (inferential reading) or Level 7 (analytical reading), while 52% of the pupils were being taught reading by teachers who performed at Level 8, the highest level, which is “critical reading.” The variation among provinces ranged from reading teachers reaching on average Level 4 (9.7%) in Inhambane to 71.7% of reading teachers reaching Level 8 in Maputo Provincia, followed by Nampula with 66.4% and Maputo Cidade with 57.8%. The percentage of teachers who reached Level 8 ranged from 35.5% in Zambézia to 71.7% in Maputo Provincia, which was the province with the best reading teacher performance in the country.

These results show that 3% of Mozambican pupils were taught by teachers who performed at or below Level 5, “interpretive reading.” Only 52% of the pupils were being taught by teachers who performed at Level 8, “critical reading,” which implies that the remaining 48% of the pupils were taught by teachers who themselves had not developed the highest level of reading ability and who, on average, attained a lower score than expected by professionals. This large percentage reveals a particular lack of subject knowledge on the part of the teachers and a sad lack of continuous development of skills. It is also to be expected that this weak test performance by such a large group of teachers would have a detrimental effect on pupil performance.

### **Teacher performance in reading in SACMEQ countries**

In this section, a comparison of Mozambican teacher performance with teacher performance in other countries in the SACMEQ reading tests is presented, analysed and discussed.

Teacher performances in reading, the mean and the percentage of teachers reaching each level of reading in SACMEQ II tests are presented in the Figure 8.2 for each of the SACMEQ countries (see Appendix 25).



Source: Data from SACMEQ database, 2004

Figure 8.2 Percentage of teachers' mean scores and attained reading levels of regional reading teachers

The expectation of the other SACMEQ countries was that the teachers would reach higher levels of performance than indicated in Table 8.2. However, the average teacher score for reading in the SACMEQ countries was 733.8, which was 266.2 points below the maximum score. There were some variations in the mean teacher performances between participating countries, ranging from 653.7 points in Zanzibar to 807.5 points in the Seychelles. Teachers in Zanzibar scored 89.1 points below the SACMEQ mean while teachers in the Seychelles scored 63.7 points above. Reading teachers from the Seychelles, Kenya, Zambia, Botswana and Swaziland performed above the SACMEQ II mean while the rest of the countries performed below the SACMEQ mean.

It can be observed that 64.9% of pupils in the SACMEQ countries were taught by teachers who performed at Level 8 (“critical reading”) while 28% of pupils were taught by teachers who performed at Level 7. Amongst those teachers who reached Level 8, variations ranged from a low 19% in Zanzibar to a high of 94.2% in the Seychelles, followed by Kenya (93.5%), Zambia (82.4%) and Botswana (82%). An area of concern in the SACMEQ countries is that 2.7% of pupils were being taught by reading teachers who performed between Levels 1 (“pre-reading”) and Level 5 (“interpretative reading”). Of interest is that in Uganda, 18% of pupils were being taught reading by teachers who performed at Level 5 or below, and in Zanzibar there was a similar occurrence with 7.1% of pupils being taught by teachers who performed at the same level.

If one examines teacher entrance requirements into the teacher training colleges, as reported in Chapter 6 (Table 6.3), entrance requirements in the SACMEQ countries vary from a Grade 10 to Grade 12 qualification requirement. However, the problem is the solid mastery of subject matter knowledge of primary education contents and the acquisition and development of skills. In order to improve teacher performance in primary education, teacher training, its curricula, the practicum, as well as assessment practices need to take the findings of this study into account (for more details see Chapter 10 Section 10.3).

### **8.1.2 Pupil Performance in Reading Mozambique**

After describing teacher performance in SACMEQ countries, it is important to present and discuss the Mozambican and regional pupil performance in SACMEQ II tests in reading.

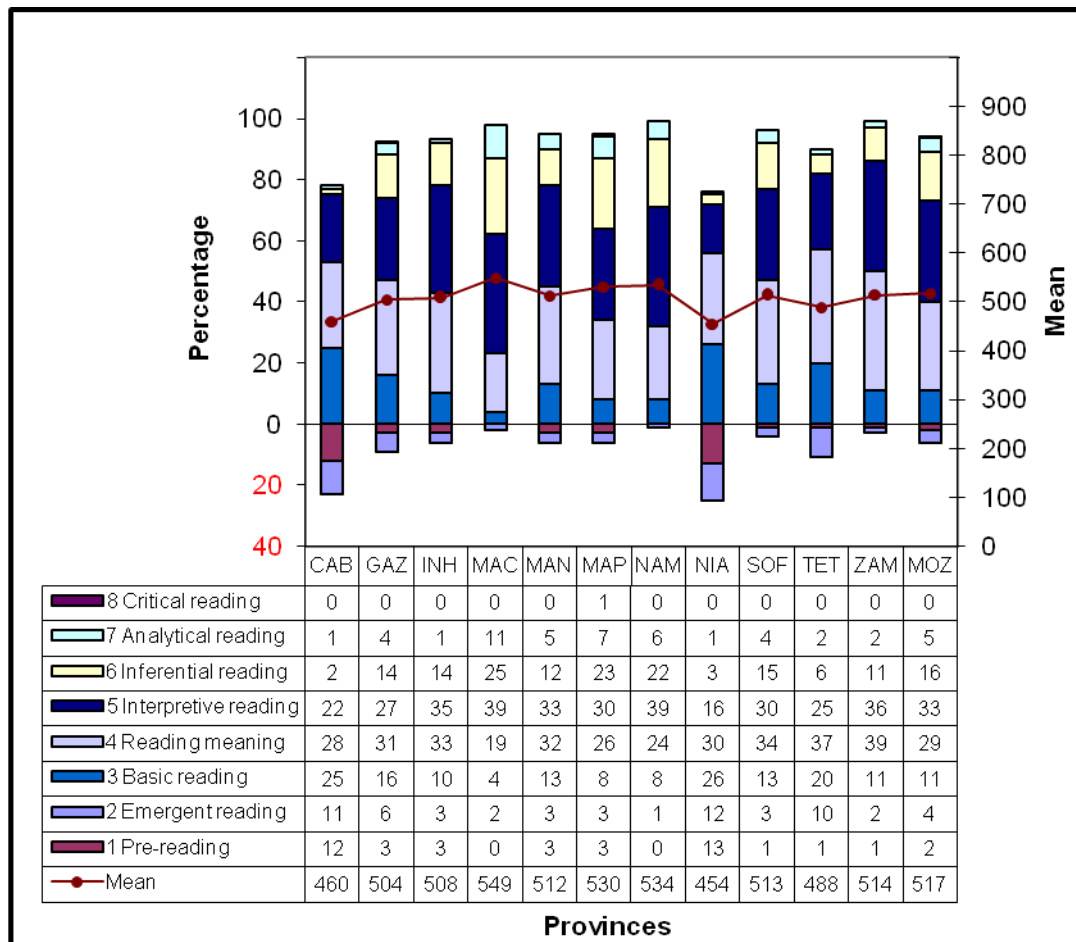
Before describing pupil performance in SACMEQ II countries as emerging from the tests, it is important to present and discuss the Mozambican pupil performance in reading and mathematics.

Teacher performance was analysed in the previous sections. Ultimately, the most important consideration is pupil performance, because the goal of the study is to analyse the pupils’ performance in relation to their teacher competence. Pupil performance in Mozambique and other SACMEQ countries is analysed in this section.

Each figure has two axes, namely percentage, presented on the left, and the mean score on the right. Pupil performance means are represented by a line, and the maximum is 1000. The multi-colour percentage bar shows the performance of pupils at different designated reading and mathematics competence levels in stacked columns (see Chapter 4, Table 4.4 for a description of these levels). The ideal scenario would be to have all pupils performing at Level 8. However, because of the variation in the case of pupils, there are also two groups. One group, located below

the line, is composed of pupils who performed below Level 3, which is considered an unacceptable level for pupil knowledge at Grade 6 for this study. The second group, situated above the line, is composed of pupils who performed up to Level 3. The consensus among SACMEQ members was to define a literate pupil as one who reached Level 3 of literacy competence (Passos, Nahara, Magaia and Lauchande, 2005, p.125).

Figure 8.3 shows the performance of pupils in reading in Grade 6 in Mozambican upper primary schools (see Appendix 26 for more details).



Source: SACMEQ database, 2004

Figure 8.3 Percentage of pupils' mean scores and attained reading levels of Mozambican reading pupils

The average score of pupils in all SACMEQ countries was 500 and the standard deviation was 100. Figure 8.3 shows that on average, pupil performance in reading was 516.7, with 16.7 points above the SACMEQ mean, which is 483.3 below the maximum score. There were some variations among the provinces, ranging from 453.8 in reading in Niassa to 549.1 in Maputo Cidade. Maputo Cidade



(549.0), Nampula (533.8) and Maputo Província (529.6) performed above the country's mean of roughly 517, while the remaining provinces performed below the mean. However, the provinces of Niassa, Cabo Delgado and Tete all performed below the SACMEQ mean of 500.

Examining the reading literacy levels reached by Mozambican pupils, it can be observed that the pupils did not achieve Level 8, the level of "critical reading." It is of concern that 1 out of 5 (17.4%) pupils performed between Level 1 ("pre-reading") and Level 3 ("basic reading"), which means that according to the above definition, 17.4% of pupils performed at or below Level 3 and are thus not considered literate. However, almost two thirds (72.6%) of Mozambican Grade 6 pupils reached appropriate literacy levels, with 29% of pupils performing at Level 4 ("reading by meaning"), 32.7% of pupils reaching Level 5 ("interpretative reading"), 16.1% reaching the ("inferential reading") of Level 6, and only 5% being "analytical readers" at Level 7.

There were considerable differences between provinces. Pupils in Niassa (51%), Cabo Delgado (47.8%) and Tete (30.2%) had the highest percentage of performance between Levels 1 and 3, which is considered very low for Grade 6. These three provinces need special attention from the Ministry of Education and Culture in order to promote reading and develop a culture of reading. To address this low level of literacy may have a positive effect on other subjects. Only one percent of the pupils from Maputo Província reached Level 8, the level of critical reading, but 11.3% of pupils in Maputo Cidade reached Level 7, with the majority of Grade 6 pupils (77.6%) performing between Levels 4 and 6. Research (SACMEQ II) has shown that there is a strong correlation between reading and performance in mathematics which means that low reading performance needs attention if pupils are to perform and achieve well (see Chapter 9 Section 9.1.3).

Pupils who have passed Grades One and Two without acquiring and developing the appropriate reading and writing skills, will find it difficult to acquire these skills because the purpose of subsequent classes is not to teach the techniques of reading and writing, but to read and write with comprehension. Pupils who have not developed these important skills will be illiterate even after six years of schooling. Another factor to stress is that reading skill, despite its important role for language, is crucial for other subjects too. For instance, if pupils cannot read effectively, good performance in mathematics, science, geography, history or in other subjects may be jeopardised. Teachers in Grades One and Two must be conscious of the consequences and the importance of reading and writing skills for pupils' lives as learners and as citizens and for the success of the education system in terms of internal and external efficiency.

Another factor to take into consideration is related to the process of teacher training, and how teachers in the teacher training colleges are trained to teach reading and writing skills. In

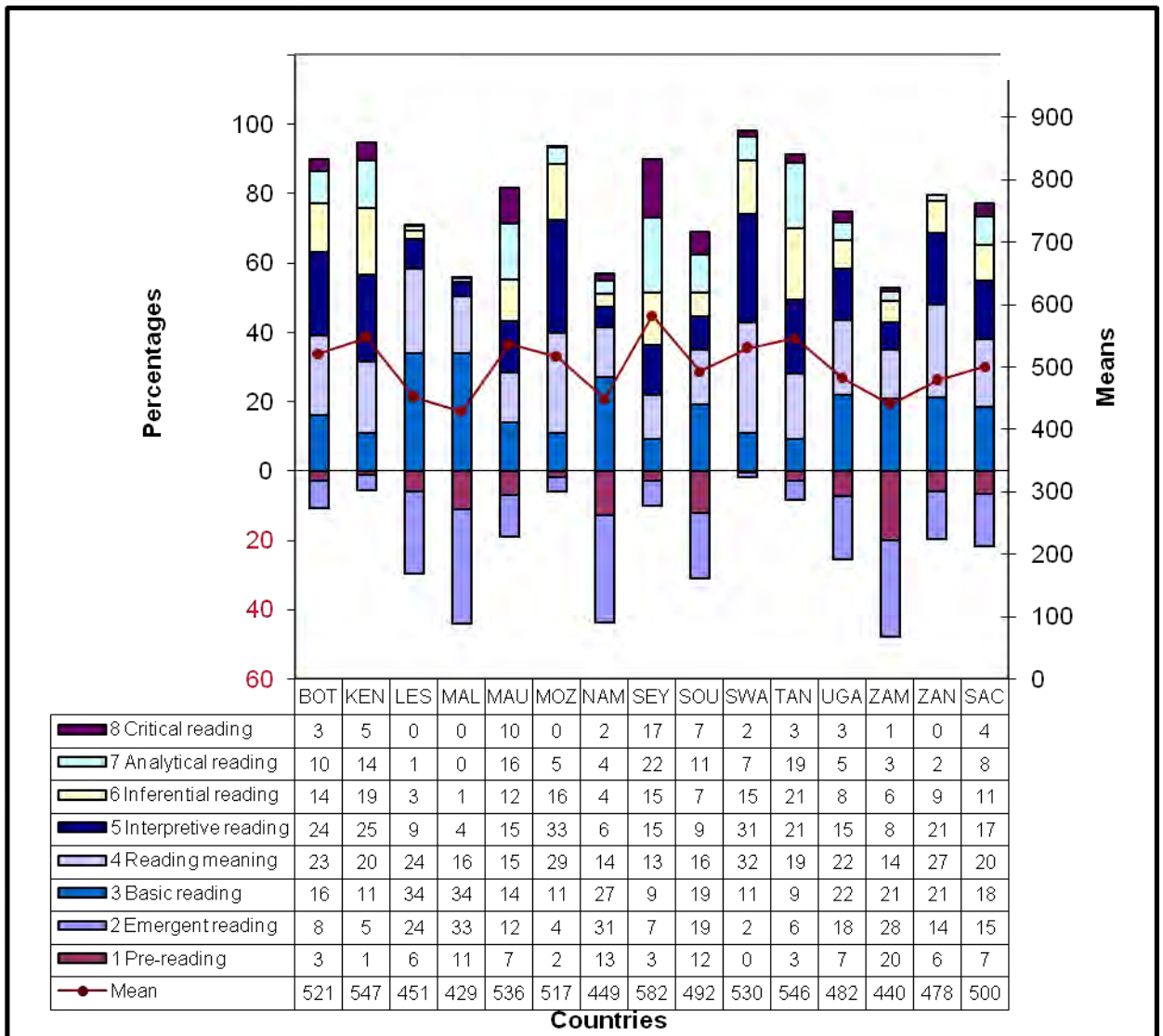
Mozambique there are some shortages in correspondence between the teacher training programmes and the programmes of the National Education System and shortages in coherence between teaching objectives, contents and methods and lower primary education and teacher training programmes (Otto, Bohme and Schafer, 1993) and this result needs to be taken into account.

In Mozambique, primary school programmes have a limited duration as the curriculum within the education system can change any time (as has been seen in other SACMEQ countries). This means that even though initial teacher training is important for students to be taught methodology and pedagogy, teacher training programmes should be diverse, deep and flexible to allow teachers to accommodate changes or development in the system of education.

### **8.1.3 Pupil Performance in Reading in SACMEQ Countries**

This section presents, analyses and discusses pupil performance in Mozambique and other SACMEQ countries in reading.

The means and the percentages of pupils reaching each of the eight reading competency levels are presented in the Figure 8.4 (see Appendix 27).



Source: Data from SACMEQ database, 2004

*Figure 8.4* Percentage of pupils’ mean scores and attained reading levels of SACMEQ countries’ reading pupils

As can be seen in Figure 8.4, pupil performance in reading was 500 on average in the SACMEQ countries. There were some variations among the countries, ranging from 428.9 in reading in Malawi to 582.0 in Seychelles. Seychelles (582), Kenya (546.5) Tanzania (545.9), Mauritius (536.4), Swaziland (529.6), Botswana (521.1) and Mozambique (516.7) were the countries where pupils performed above the SACMEQ mean, while the remaining countries performed below the SACMEQ mean (500).

The percentages of pupils reaching the eight different levels of reading are presented in the above figure. Despite the fact that by Grade 6 the pupils have had 6 years of schooling, 40% of pupils in the SACMEQ countries managed only to perform between Levels 1 and 3, a basic reading level or

worse The majority (56%) performed between Level 4 (reading for meaning) and Level 7 (analytical reading), while a mere 3.7% performed at Level 8 (critical reading).

The findings also show that the lowest percentages can be observed at Levels 1, 7 and 8 and the highest percentages at Levels 3 and 4. The percentages begin to increase at Level 2 and to decline at Level 6. Swaziland (2%), Kenya (5.6%), Mozambique (6.2%), Tanzania (8.3%) and Seychelles (10.4%) had the lowest percentage of pupils that performed at Levels 1 and 2. Seychelles had the highest percentage (16.7%) of pupils that had reached Level 8 (critical reading), followed by Mauritius (10.3%) and South Africa (6.6%).

There were considerable differences among countries. The results also show that countries such as Malawi (78.1%), Namibia (70%), Zambia (68.6%), Lesotho (63.2%), South Africa (50.1%), Uganda (47.3%) and Zanzibar (41.2%) had the highest percentage of pupils that performed between Levels 1 and 3, which is a very low achievement level for Grade 6. These results suggest that special attention from educational authorities and the implementation of specialised programmes to improve reading and writing skills are needed to address this literacy deficit. As pointed out in the Mozambican report, reading and writing skills have major implications for pupil performance in school and in their lives, as well as on the success of the education system - as confirms:

It is never much to stress that everything a child will learn in the future depends on its reading ability. Therefore, it is important that a child's first contact with reading turns out to be a success and not a failure. If the child has easily learned to read then s/he is ready for the task which s/he will have in the future. But if a child has failed s/he will carry a burden (UNESCO, 1973 p.54).

The low quality of an education system "affects not only the internal efficiency of the educational system but also results in a situation where only a few graduates of the school and higher education system could attain the expected skills and competencies" (Aggarwal, 2000, p.2). In addition, most importantly for all pupils, "It is demonstrated by many researchers that a solid foundation in mathematics and language is necessary for primary school children to navigate the information in this technological age. Students with a strong grasp in mathematics have an advantage in academics as well as in the job market" (Aggarwal, 2000, p.14).

The fact that the results reveal a high percentage of pupils who performed at Levels 1 to 3 means that there are factors impeding scholastic progress within the system of education, that should be identified and addressed. A host of factors could be responsible, but one could be the acquisition of reading and writing skills and therefore, a deeper analysis would be required in order to identify

these factors at an earlier stage. Thus, it is suggested that the Ministries of Education in these countries should carry out two kinds of research studies.

The first kind would be an assessment of primary education incorporating investigation into:

- ❖ The level of teacher knowledge of reading and writing skills methodology.
- ❖ How teachers implement the methodology of acquiring and developing reading and writing skills.
- ❖ How textbooks implement the methodology of acquiring and developing reading and writing skills.
- ❖ How teachers prepare pupils to acquire and develop reading and writing skills.

The purpose of such a study would be to identify the major difficulties pupils experience in acquiring and developing reading and writing skills, and to evaluate the level of teacher knowledge of the methodology.

The second kind would be an assessment of all teacher training processes with a focus on the methodology of teaching reading and writing skills, including:

- ❖ The curriculum for teacher training;
- ❖ The trainers' profiles;
- ❖ The modules in teacher training colleges;
- ❖ Teacher profiles at Annexe schools;
- ❖ Pedagogical practices at primary school level; and
- ❖ Textbooks used in primary schools.

The purpose of the study would be to identify the problems that might cause weak teacher performance.

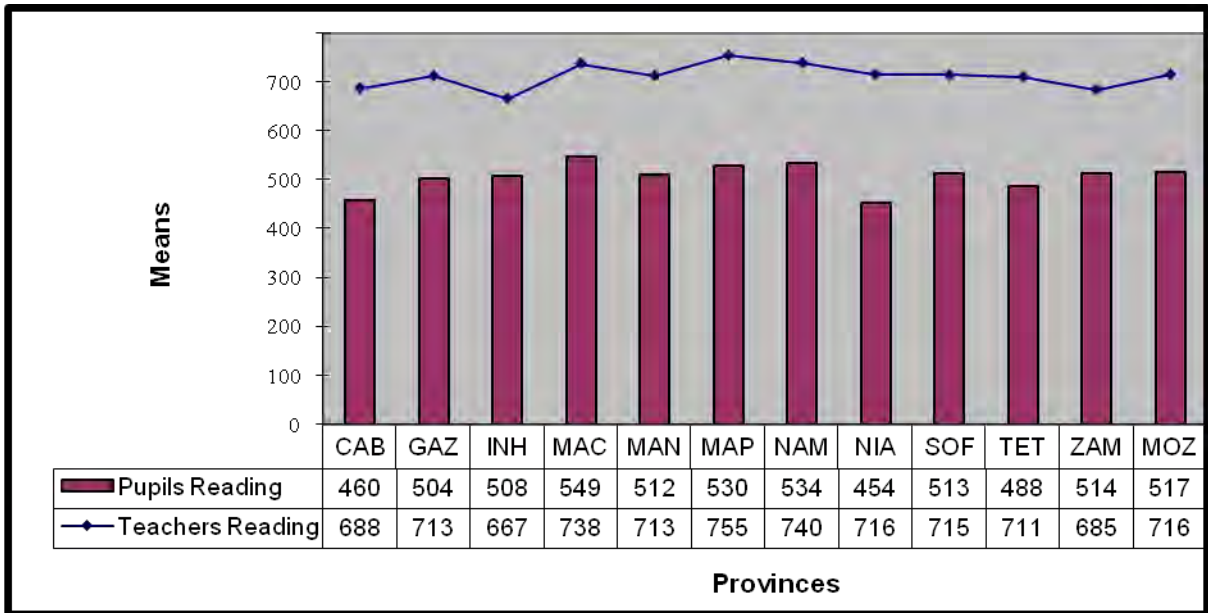
#### **8.1.4 Teacher and Pupil Performance in Reading in Mozambique and in SACMEQ Countries**

The performance of Mozambican teachers and pupils in the SACMEQ reading tests is presented, analysed and discussed in this section at national and provincial level.

### **Teachers and pupil performances in reading in Mozambique**

As stressed by many authors, namely Kanu (1996), Medley, (1982), Grossman (1995) and Shulman (1986), just to mention a few, there is a relationship between teacher quality and pupil performance. Grossman (1995) insists that without the essential base of subject matter knowledge, primary teachers are simply unable to provide effective instruction. The level of confidence in subject matter affects teaching and the way the teachers teach (Shulman, 1986) and consequently the way pupils learn and ultimately, their achievement. In order to find out how pupils and teachers perform in Mozambique and in SACMEQ countries, this section analyses teacher and pupil performance.

Figure 8.5 shows teachers and pupils' performance in reading in Grade 6 in Mozambique (see Appendix 28).



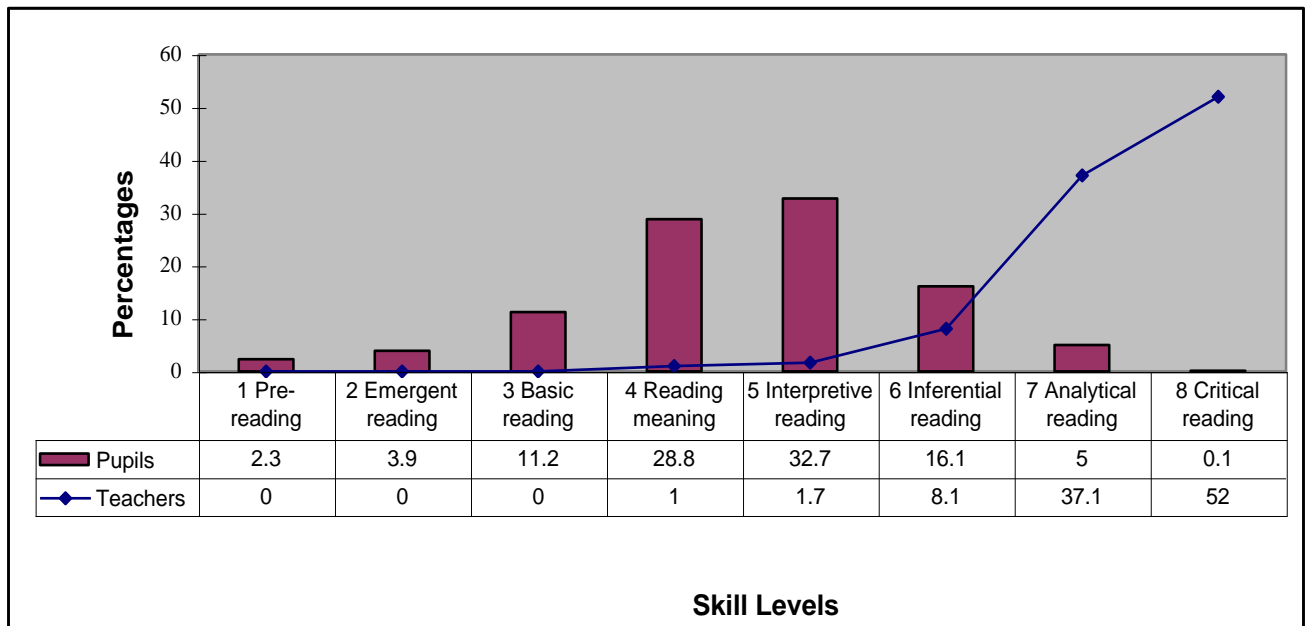
Source: Data from SACMEQ database, 2004

*Figure 8.5* Mean scores of reading pupils and teachers in Mozambique

Figure 8.5 shows that in Mozambique on average teachers performed better in both reading (716.2) than their pupils, who had 516.7 points in reading. A variation among provinces is seen, in comparing the differences between teachers and pupils’ performance. The difference between teachers and pupils in terms of performance in reading ranged from 159 in Inhambane to 262 in Niassa.

Figure 8.6 shows Mozambican teachers and pupils’ performance in reading at different levels of competency (see Appendix 29).





Source: Data from SACMEQ database, 2004

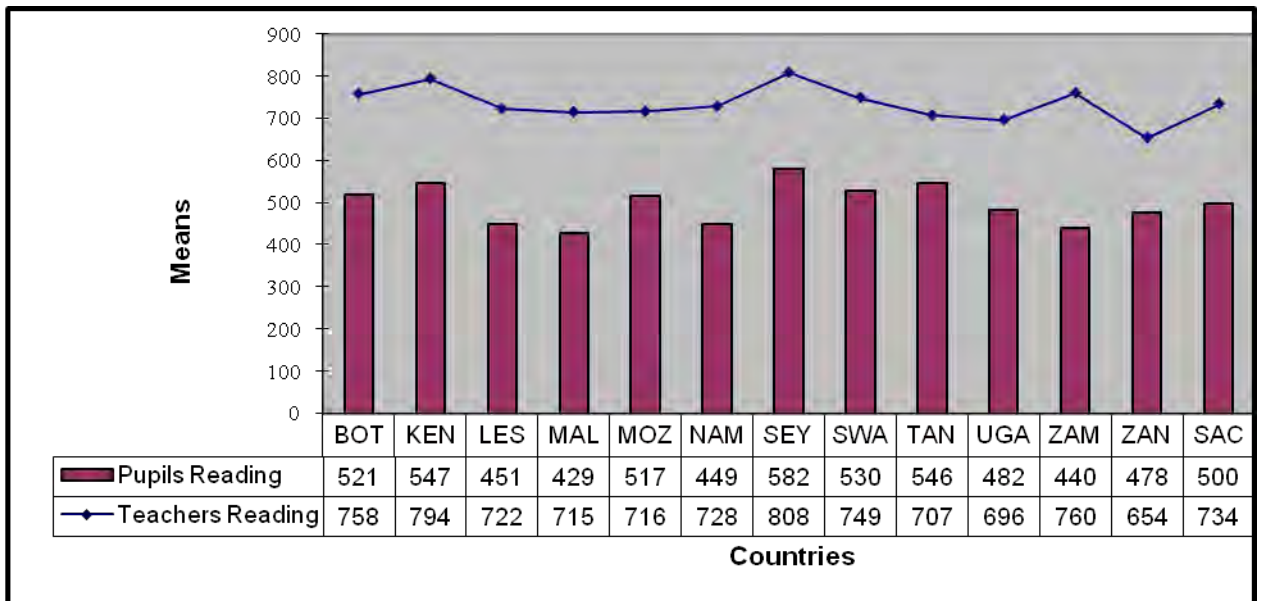
*Figure 8.6* Percentage of Mozambican teachers and pupils’ performance in reading at different levels of competency

Figure 8.6 shows that pupil performance decreased at Level 6 and teacher performance consistently increased from Level 6, “inferential reading”. The findings show that in Mozambique the lowest pupil percentages can be observed at Levels 1, 2, 7 and 8, with the highest percentages being found at Levels 4 and 5. The percentages begin to increase at Level 3 and decline at Level 6. In the case of teachers, the findings show that the lowest percentages can be observed at Levels 1, 2, 3, 4 and 5 and the highest percentages at Levels 7 (analytical reading) and 8 (critical reading), which shows an increase in the level of literacy among teachers.

The next section presents teacher performance in SACMEQ countries as well as their pupils’ performance in reading tests.

### **Teacher and pupil performance in SACMEQ countries**

Figure 8.7 shows teachers and pupils’ performance in reading in Grade 6 in the SACMEQ countries (see Appendix 30).

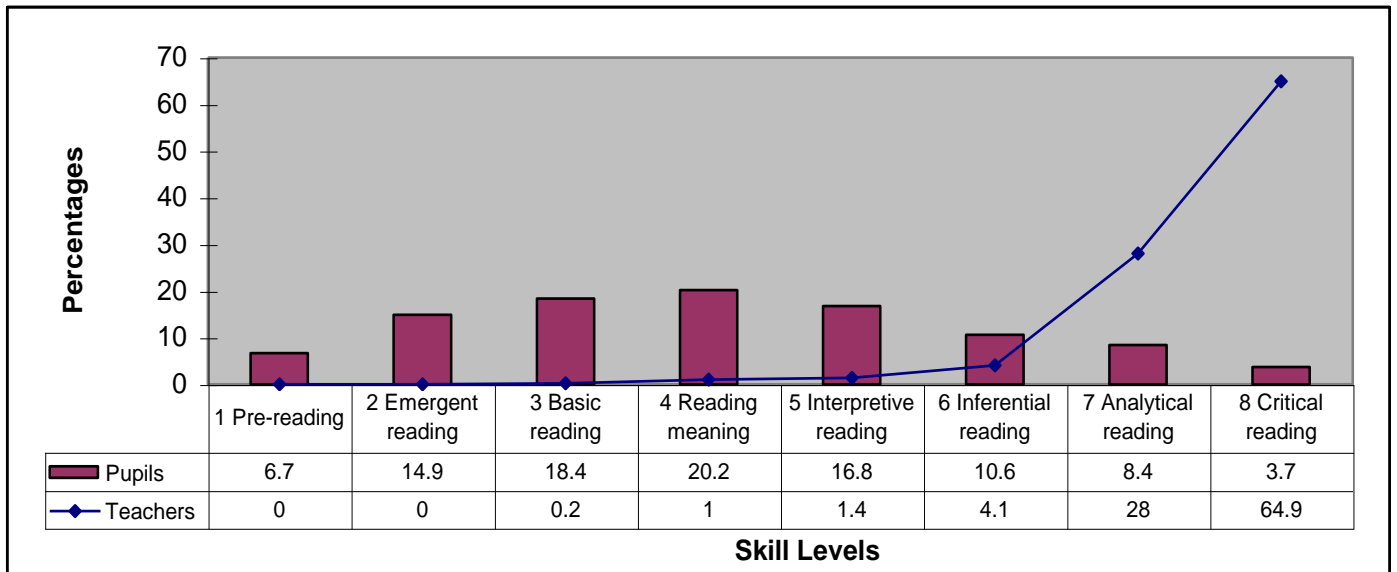


Source: Data from SACMEQ database, 2004

*Figure 8.7* Mean scores of reading pupils and teachers in SACMEQ countries

Just as in Mozambique, teachers in the SACMEQ countries performed on average higher than their pupils, achieving a mean of 733.8 in reading. In SACMEQ countries, the difference between teachers and pupils in terms of performance in reading ranged from 176 in Zambia to 286 in Malawi.

Figure 8.8 shows teachers and pupils' performance in different reading competency levels in the SACMEQ countries (see Appendix 31).



Source: Data from SACMEQ database, 2004

*Figure 8.8* Percentage of SACMEQ teachers and pupils’ performance in reading at different levels of competency

In the case of pupils in the SACMEQ countries, the lowest percentages can be observed at Levels 1, 7 and 8, and the highest percentages at Levels 3 and 4. The percentages begin to increase at Level 2 and decline at Level 6. In the case of teachers, the findings show that the lowest percentages can be observed at Levels 1, 2, 3, 4 and 5 and the highest percentages at Levels 7 (analytical reading) and 8 (critical reading).

**Pupil performance in reading by gender, socio-economic status and school location in Mozambique and in SACMEQ countries**

In order to find out the impact of other factors on pupil performance, the following section presents and discusses pupil performance in reading by gender, socio-economic status and school location in Mozambique and in other SACMEQ countries

To analyse the results relating to gender, socio-economic status and school location, the eight levels were reduced and combined into four categories, in accordance with the Mozambican marking scale, and will be classified as: Category 1 poor, Category 2 fair, Category 3 good, and Category 4 very good:

**In reading, the categories are as follows:**

Category 1 comprises Levels 1 “pre-reading”, 2 “emergent reading” and 3 “basic reading”

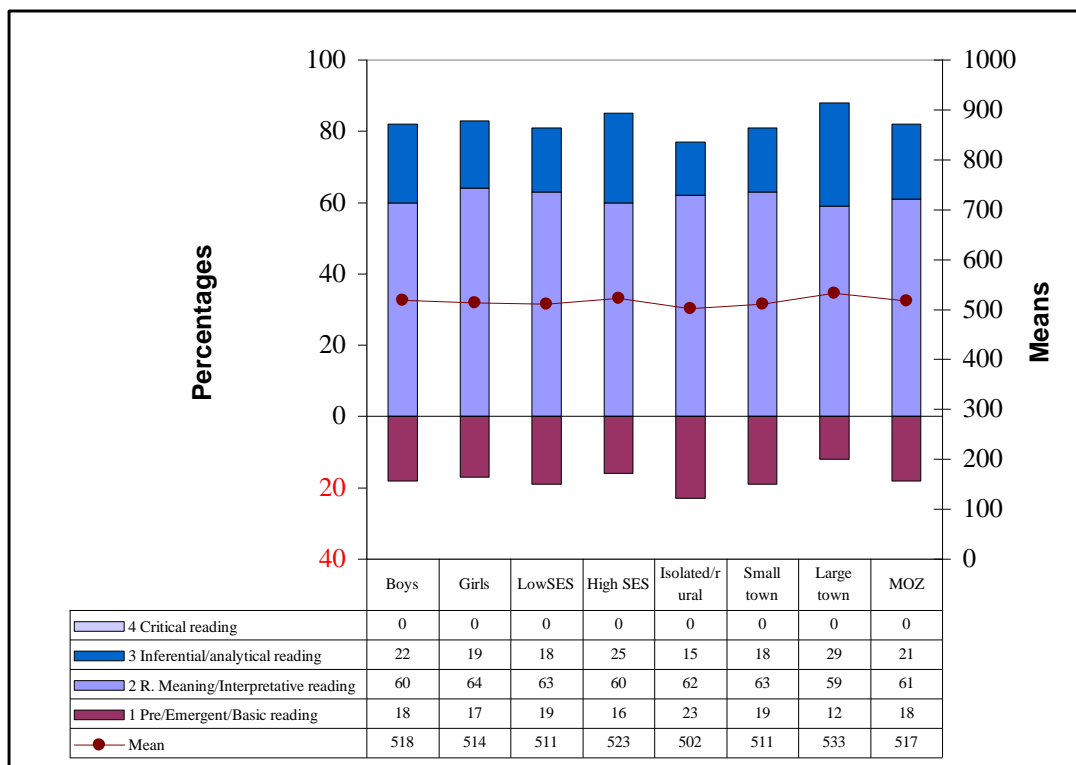
Category 2 comprises Levels 4 “reading for meaning” and 5 “interpretive reading”

Category 3 comprises Levels 6 “inferential reading” and 7 “analytical reading”

Category 4 comprises Level 8 “critical reading”.

**Pupil performance in reading by gender, socio-economic status and school location in Mozambique**

Figure 8.9 shows pupils’ mean performance in reading by gender, socio-economic status and school location (see Appendix 32).



Source: SACMEQ database, 2004

*Figure 8.9* Percentage of pupils’ mean scores and attained reading categories of Mozambican reading pupils by gender, socio-economic status and school location

Figure 8.9 demonstrates that all means were above the SACMEQ mean (500) but little difference was seen between the sub-groups in terms of the mean and the levels achieved by pupils. Boys performed slightly better than girls in reading (518.4; 514.1). Furthermore, pupils from higher SES performed slightly better than pupils from low SES (523; 510.5), while pupils from large towns performed better than pupils from small towns and isolated or rural areas (533.3; 510.5 and 502.3) respectively. The same figure shows the different reading competency levels of pupils according to

their gender, socio-economic status and school location with 17.6% performing at the level of Category 1, the majority (61.4%) reaching Category 2, and 20.9% performing at the level of Category 3.

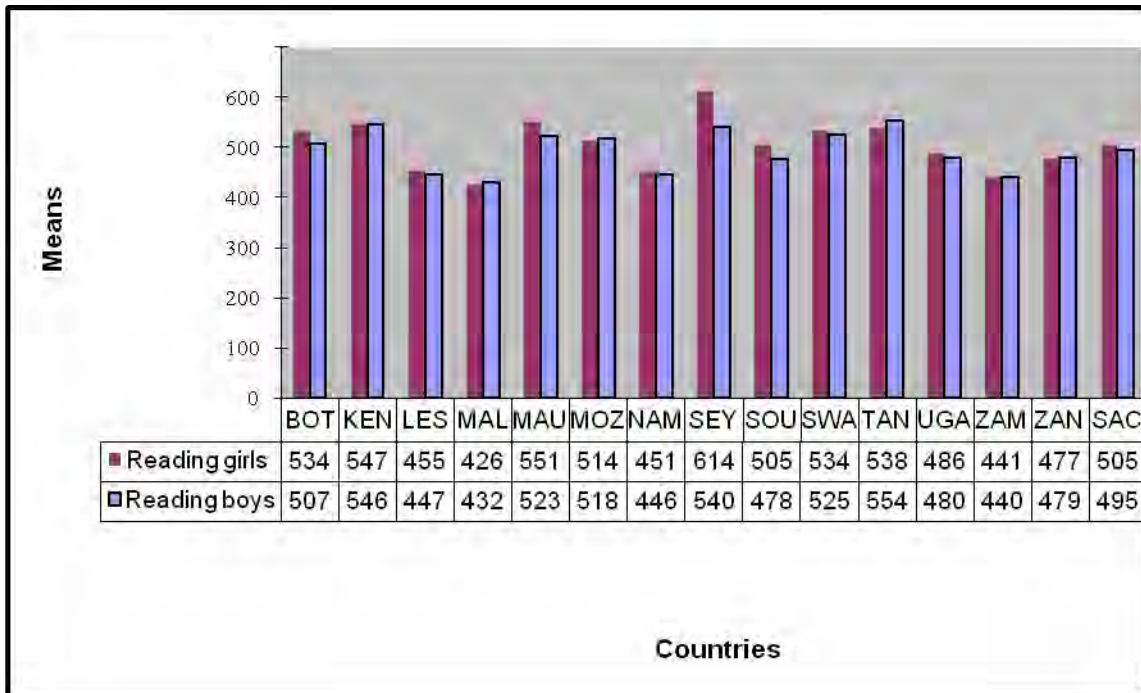
In terms of gender, 17.7% and 16.8% of boys and girls respectively reached Category 1 and 22.2% of boys and 19.4% of girls performed within Category 3. The majority of boys (59.9%) and girls (63.8%) reached Category 2.

Examining pupils' performance according to their SES, it can also be seen that 19.1% of pupils from a low socio-economic status and 15.7% of pupils from high socio-economic status reached Category 1 ("pre/emergent/basic reading"), while 17.6% of pupils from low SES performed within Category 3 and 24.6% of pupils from a high SES reached Category 3. However, the majority (63.1%) of pupils from a low SES and a high SES (59.7%) reached precisely Category 2.

Figure 8.9 also reveals pupil performance according to school location. A higher percentage of pupils from isolated/rural areas (22.9%) managed to reach only Category 1, in contrast with pupils from small towns (19%) and large towns (12%). Pupils from isolated or rural areas (15.2%), from small towns (18%) and large towns (29.3%) performed at Category 3. The majority of pupils 61.9%, 62.6% and 59% respectively from isolated/rural areas, small towns and large towns, reached precisely Category 2.

### **Pupil performances in reading by gender in SACMEQ countries**

Figure 8.10 shows pupil performance in reading by gender (for more information see Appendix 33).



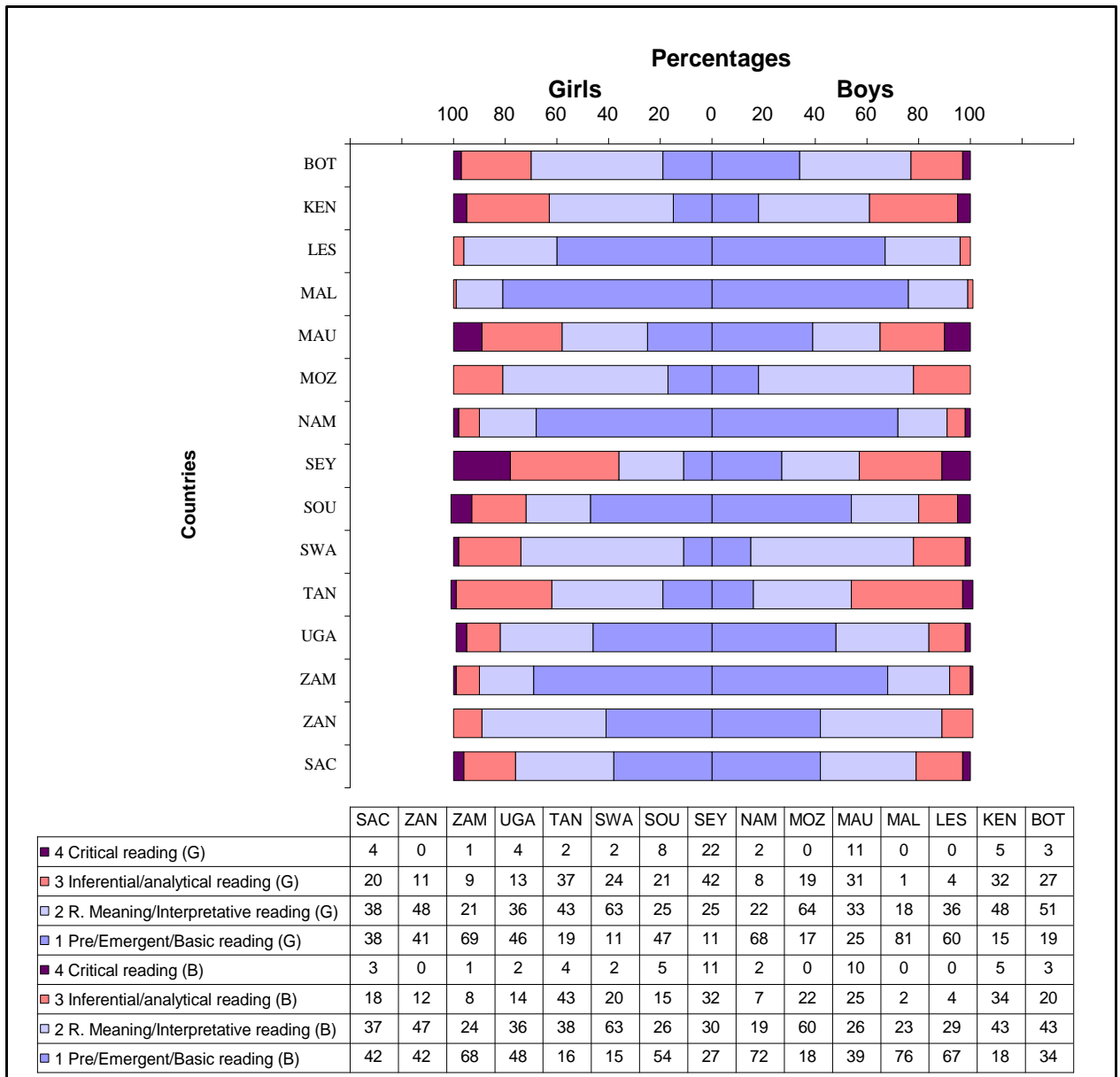
Source: Data from SACMEQ database, 2004

Figure 8.10 Mean scores of reading pupils of SACMEQ countries by gender

Figure 8.10 shows that in the SACMEQ countries, on average, girls performed better in reading (505.1) than boys (494.6). In contrast, boys in Lesotho, Malawi, Mozambique, Tanzania and Zanzibar performed better in reading than girls. Malawi had the lowest pupil performance for reading, with girls achieving an average of 425.6 points for reading in contrast to the boys achieving 431.9. Girls performed better than boys in reading (614.2) in Seychelles and in mathematics (590.2) in Mauritius, but in Tanzania, boys performed better than girls in reading (554.3).

Figure 8.11 shows pupil performance by gender in the SACMEQ countries. An explanation is given to facilitate the reading of this and subsequent bar graphs. The left-hand axis lists the SACMEQ countries in alphabetical order, and the top axis gives the percentages of competency. The left-hand bar illustrates the performance of girls in combined reading competence levels, while the right-hand bar illustrates that of the boys. The levels of reading competency are listed below the bar graph, with the results from individual SACMEQ countries.

Figure 8.11 presents pupil results by gender in the SACMEQ countries on the combined reading competency levels (see Appendix 34 for details).



Source: Data from SACMEQ database, 2004

Figure 8.11 Percentage of pupils' reading categories in SACMEQ countries by gender

On average, girls performed better in reading than boys. For instance, on average 42.3% and 37.7% of boys and girls respectively performed at Category 1 and 36.6% and 37.7% of boys and girls respectively reached Category 2. Almost a fifth (18.1%) of boys and 19.6% of girls reached Category 3 with only 3.5% of boys and 4.8% of girls performing in Category 4. In the Indian study referred to previously, “the differences in mean achievement scores due to gender were reflected both in language and in mathematics. However, the girls scored much lower in mathematics as compared to the boys” (Aggarwal, 2000, p.6).

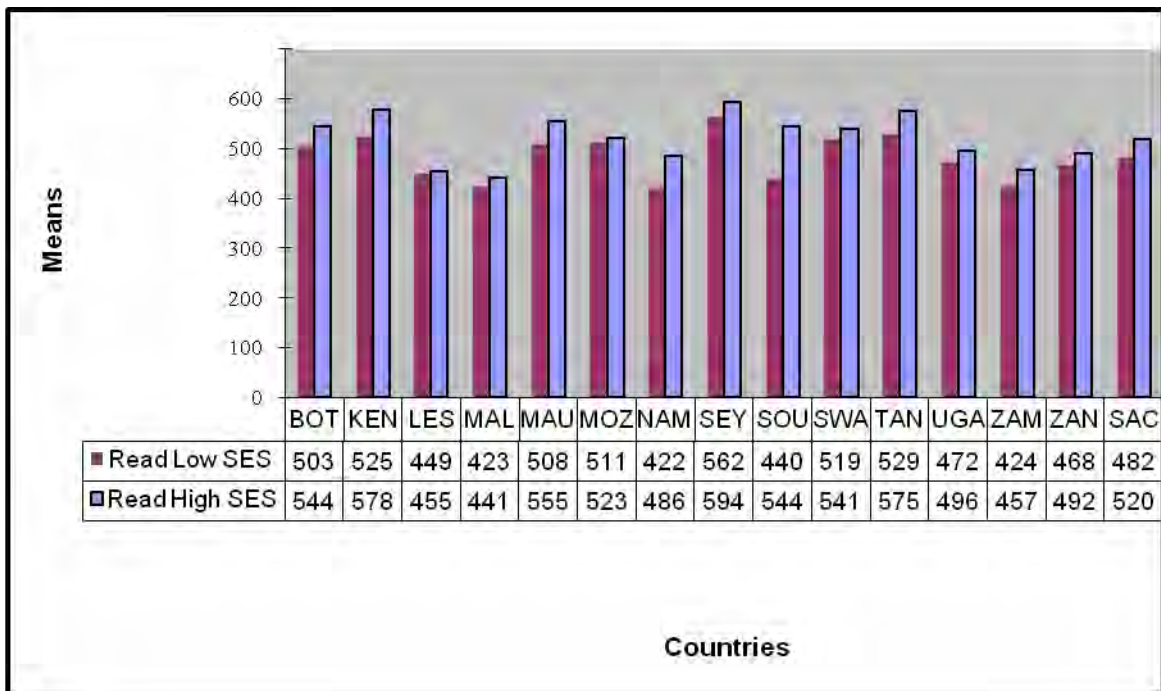


Girls reached higher categories in reading than boys in the majority of countries, and it is important to stress that Seychelles was the only country where girls reached the highest reading categories - 41.8% and 21.9% performed at Categories 3 and 4 respectively. There were large variations among the SACMEQ countries, ranging from 80.9% of girls only reaching Category 1 in Malawi, to 21.9% reaching Category 4 in Seychelles. The variation for boys ranged from 75.5% performing in Category 1 in Malawi to 11.4% of boys performing in Category 4 in Seychelles.

When examining each category, it can be observed that among girls that reached Category 2, the variation ranged from 63.8% in Mozambique to 18% in Malawi, while for boys in the same category the variation ranged from 63% in Swaziland to 18.8% in Namibia. For Category 3, the variation ranged from 41.8% in Seychelles to 0.8% in Malawi, whilst for both girls and boys the variation ranged from 42.5% in Tanzania to 2% in Malawi. Boys (11.4%) and girls (21.9%) reached the highest category in Seychelles. In Mozambique only 0.2% boys and in Lesotho 0.2% of girls and 0.3% boys reached Category 4 while in Mozambique (0% of girls) Malawi (0% and 0%), and Zanzibar (0 and 0%) were the countries where pupils did not reach Category 4.

#### **Pupil performances in reading by socio economic status in SACMEQ countries**

Figure 8.12 shows SACMEQ pupil performance in reading according to socio-economic status (see Appendix 35).

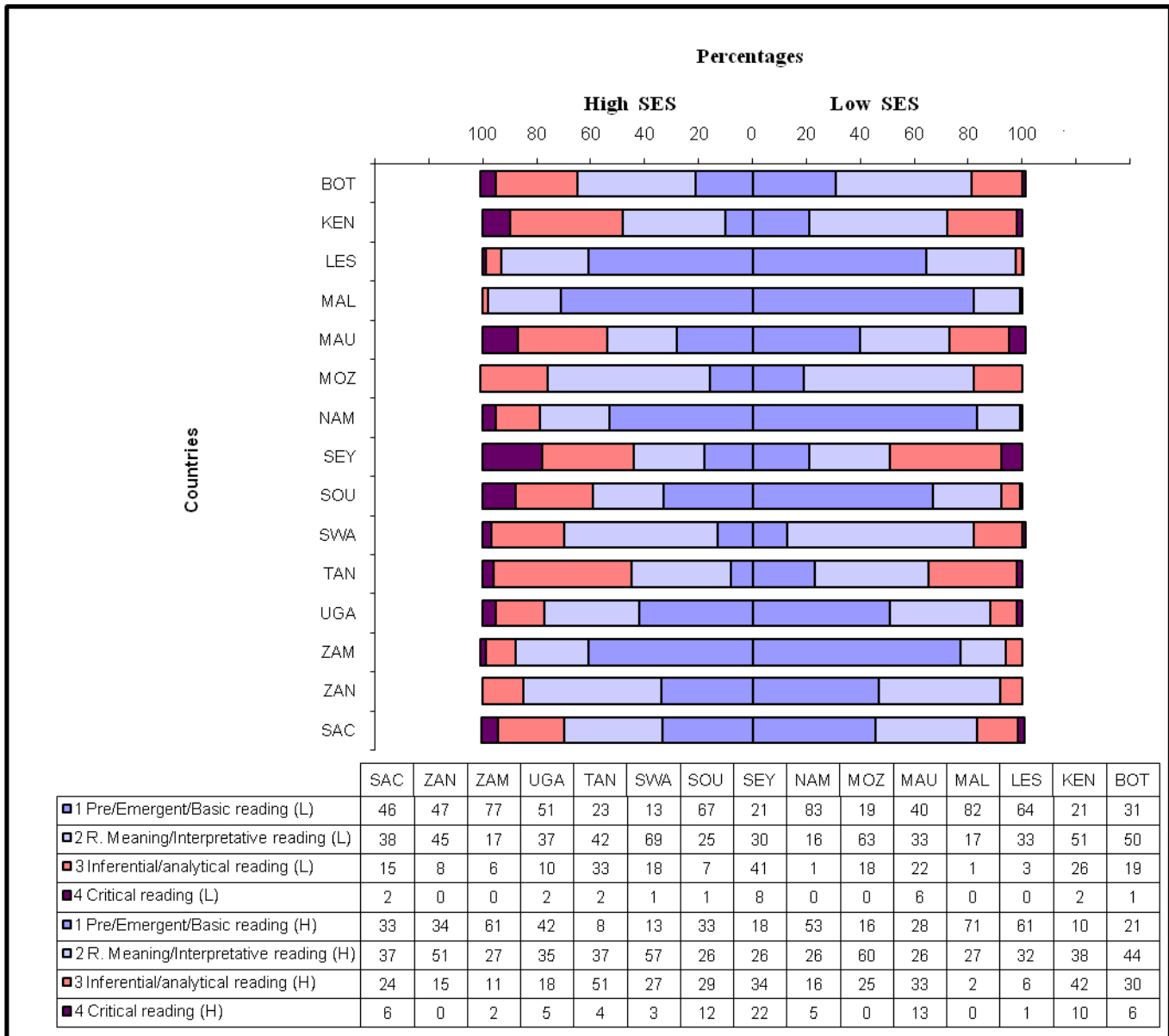


Source: Data from SACMEQ database, 2004

*Figure 8.12 Mean scores of reading pupils of SACMEQ countries by socio-economic status*

Figure 8.12 shows that, on average, pupils from a low SES had 482.4 points in reading, while pupils from a high SES had 519.9. This figure demonstrates that in the SACMEQ countries, on average, pupils from a low SES scored much lower in reading than pupils from a high a SES. In reading, the variation among countries ranged from 421.5 points in Namibia to 561.8 in Seychelles for pupils from a low SES. For pupils from a high SES, the variation ranged from 440.7 in Malawi to 594.4 in Seychelles.

Figure 8.13 shows percentages of pupil performance at different levels of reading competency in SACMEQ countries by socio-economic status (see Appendix 36 for more details).



Source: Data from SACMEQ database, 2004

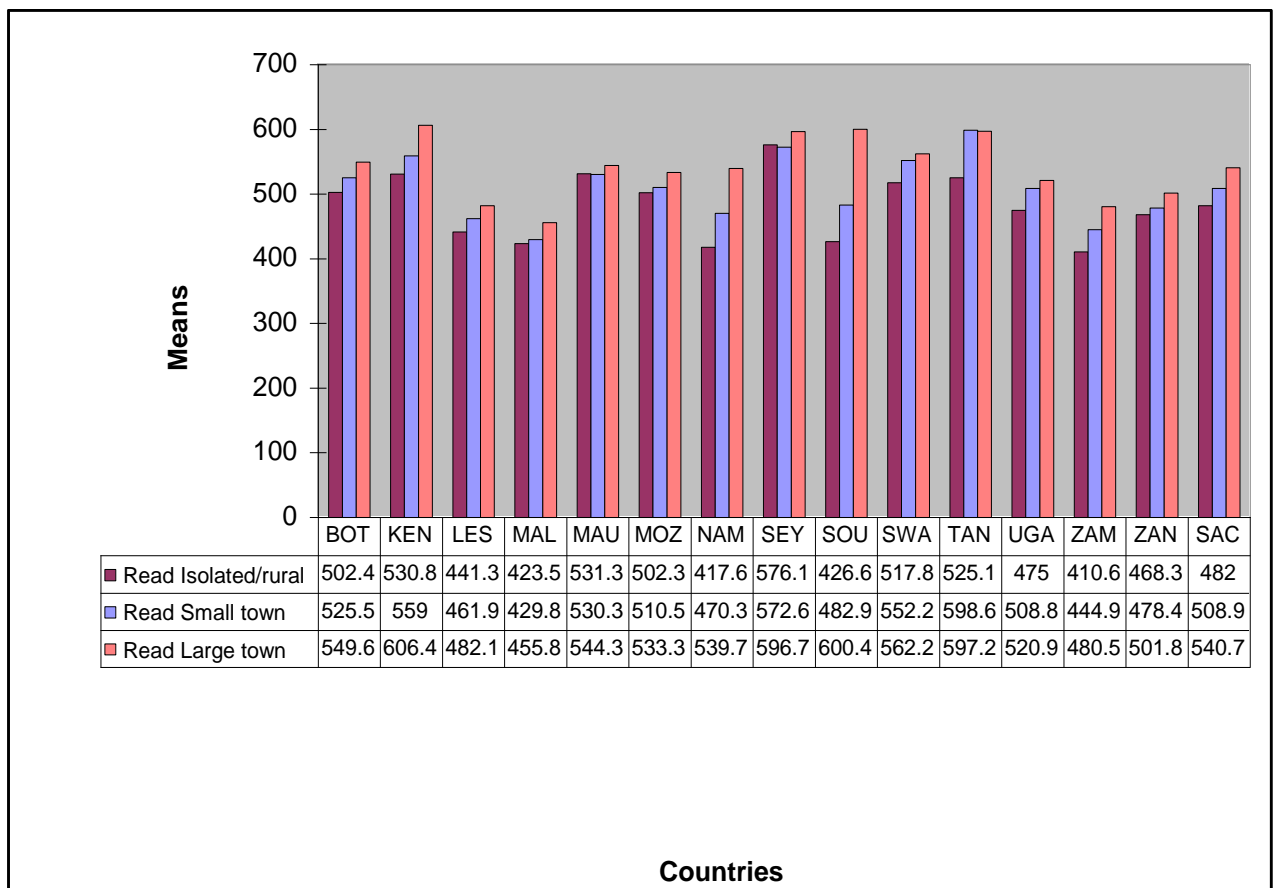
*Figure 8.13* Percentage of pupils’ reading categories in SACMEQ countries by socio-economic status

In Figure 8.13 above, it can be seen that pupils in all SACMEQ countries from a higher SES have reached higher categories in reading than pupils from low SES. On average, 33.5% and 45.5% of pupils from a higher SES and a lower SES respectively performed at Category 1, and 36.5% and 37.8% of pupils from a higher SES and from a lower SES respectively reached Category 2, while 24.1% and 15.0% of pupils from a higher SES and from a lower SES reached Category 3. Finally, 6.1% of pupils from a higher SES and 2.1% from a lower SES reached Level 4.

Among pupils from a higher SES, Seychelles was the only country where pupils (21.8%) reached Category 4, while from a lower SES, 8.3% of pupils from Seychelles reached Category 4. For pupils from a higher SES that performed in Category 1, the variation ranged from 71.1% in Malawi to 7.9% in Tanzania, and among pupils from a lower SES, the variation ranged from 82.6% in Namibia to 13.4% in Swaziland. Among pupils from a higher SES that reached Category 2, the variation ranged from 59.7% in Mozambique and 26.7% in Malawi, while for pupils from a lower SES in the same category the variation ranged from 68.7% in Swaziland to 15.8% in Namibia. In Category 3, the variation ranged from 42.4% in Kenya to 2.2% in Malawi for pupils from a higher SES and for pupils from a lower SES the variation ranged from 40.7% in Seychelles to 1% in Malawi.

### Pupil performances in reading by school location in SACMEQ countries

Figure 8.14 shows the mean performance of pupils in reading according to school location (see Appendix 37).



Source: Data from SACMEQ database, 2004

Figure 8.14 Mean scores of reading pupils in SACMEQ countries by school location

From the analysis in Figure 8.14 above, it can be observed that in reading, on average, pupils from isolated/rural areas in the SACMEQ countries had a mean of 482 points, those from small towns had a 508.9 mean, while pupils from large towns had a 540.7 mean. On average, pupils from isolated/rural and small towns in the SACMEQ countries had much lower mean performances in reading and mathematics than pupils from large towns. This pattern was apparent in all countries apart from Mauritius and Seychelles where pupils from isolated or rural areas performed better in reading than pupils from small towns. In Tanzania, pupils from small towns had better performance in reading than pupils from large towns. In the isolated/rural areas, the variation in average performances for reading among countries ranged from 410.6 in Zambia to 576.1 in Seychelles, in small towns the variation ranges from 429.8 in Malawi to 598.6 in Tanzania, while for pupils from large towns the variation ranges from 455.8 in Malawi to 600.4 in South Africa.

Figure 8.15 shows the percentages for reading results by school location (see Appendix 38).

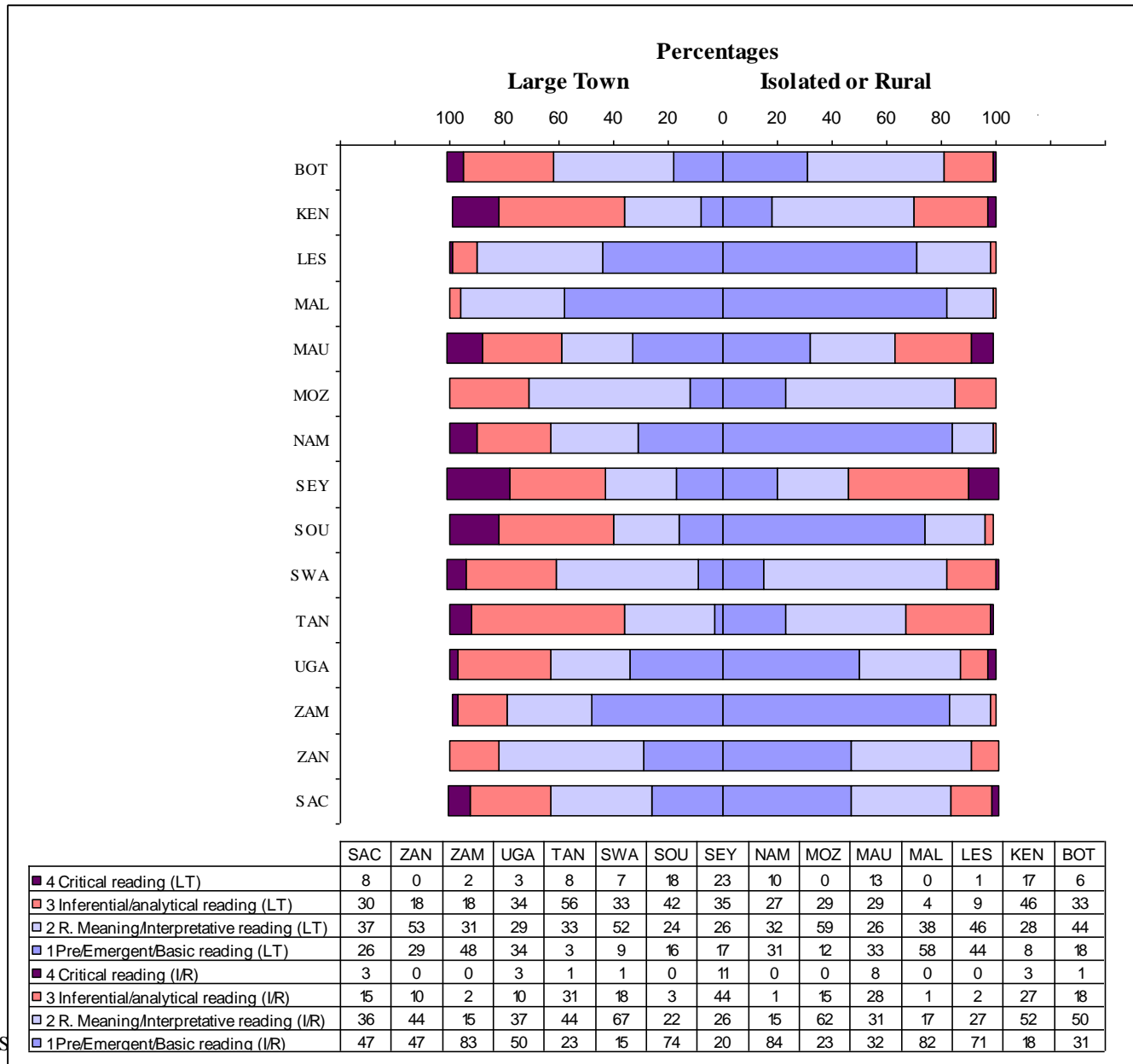


Figure 8.15 Percentage of pupils' reading categories in SACMEQ countries by school location

The different categories of competence are presented in Figure 8.15 above, according to the school location. Two variables were selected for this analysis: isolated or rural areas, and large towns. In all SACMEQ countries, pupils living in large towns reached higher categories of performance than pupils living in isolated or rural areas. In terms of means reached by pupils in the two areas, it can be observed from the figure that on average 25.6% of pupils from large towns and 46.6% from isolated or rural areas reached Category 1. Some 36.9% pupils from large towns and 36.3% from isolated or rural areas reached Category 2, while 29.5% of pupils from large towns and 14.9% from

isolated areas reached Category 3. Finally, 8% of pupils from large towns and 2.5% from isolated or rural areas reached Level 4.

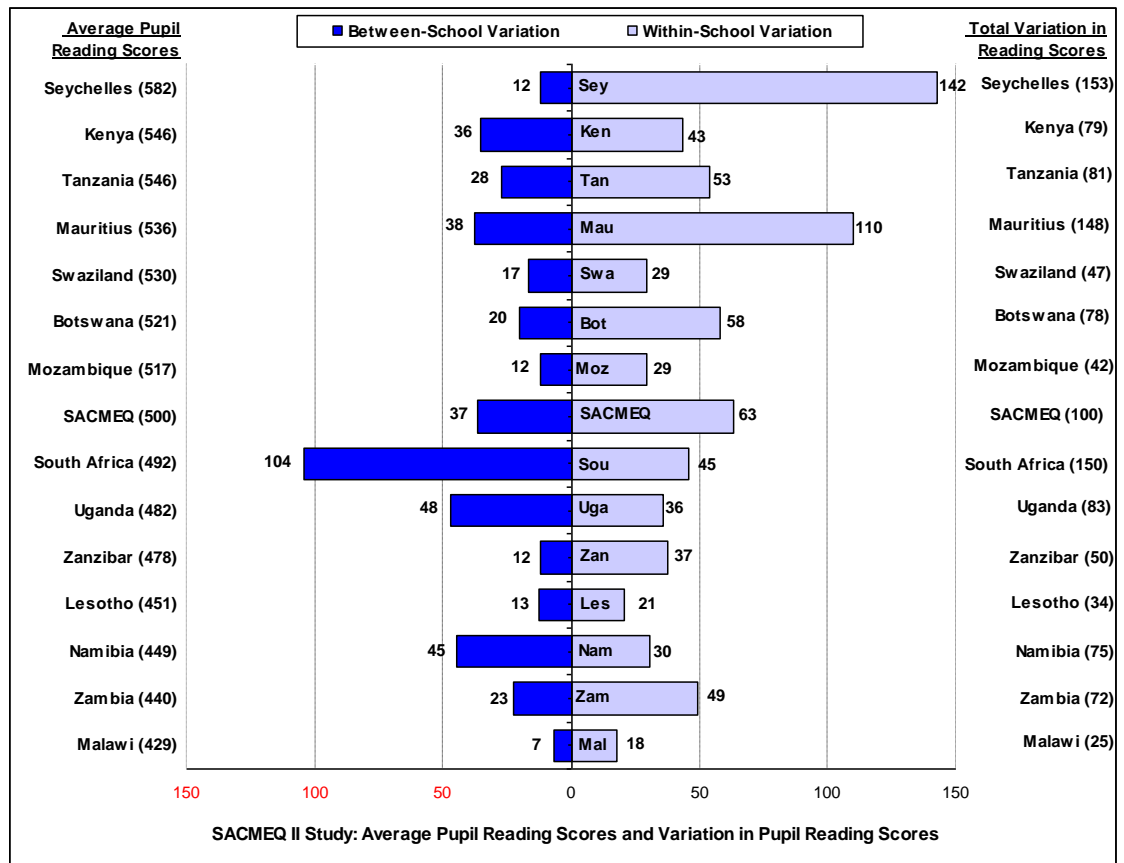
Some 22% of pupils in large towns in the Seychelles reached Category 4, whereas no learners in Malawi and Mozambique reached the same level. In isolated or rural areas, 11% of pupils in Seychelles and no pupils in Malawi, Mozambique and Namibia reached Category 4.

Pupils from large towns that reached Category 1 vary from 58.3% in Malawi to 3.1% in Tanzania, and among pupils from isolated or rural areas, the variation ranged from 84.2% in Namibia to 14.7% in Swaziland. Among pupils from large towns that reached Category 2, the variation ranged from 59% in Mozambique to 23% in South Africa, while for pupils from isolated or rural areas in the same category the variation ranged from 67.2% in Swaziland to 15.1% in Namibia and Zambia. In Category 3, the variation ranged from 56.2% in Tanzania to 4.4% in Malawi for pupils from large towns, and for pupils from isolated or rural areas the variation ranged from 43.5% in Seychelles to 0.6% in Malawi.

#### **Variation in reading performance in the SACMEQ countries between schools and within schools**

Figure 8.16 presents the between-school and within-school variation in reading performance in SACMEQ countries. The left-hand column of Figure 8.16 presents the average of pupils' performance in reading in SACMEQ countries, which has already been presented and discussed earlier in this chapter. The right-hand column shows the total variation in pupils' reading scores in SACMEQ countries. The bars on the left show the variation among schools, while the bars on right show the variation within schools. The total variation was 100 in the SACMEQ countries as a whole.





Source: Dolata, Ikeda and Murimba, 2004

Figure 8.16 Average of pupils' reading scores and variation in pupils' reading scores in SACMEQ countries

The total variation among SACMEQ countries ranges from 25 in Malawi to 153 in Seychelles. South Africa, Mauritius and Seychelles were the countries that present a total variation higher than the SACMEQ variation (100). Taking into account the variation within schools, it can be observed that Seychelles (142) is the SACMEQ country that presents the biggest variation, followed by Mauritius (110), while Malawi (18), Lesotho (21), Mozambique (29) and Swaziland (29) were the countries that present the smallest variation within schools.

In terms of the variation between schools, it can be observed in Figure 8.16 that South Africa (104) was the country that had the biggest variation between schools, followed by Uganda (48) and Namibia (45), while Malawi (7) had the smallest variation, followed by Seychelles, Mozambique and Zanzibar with a school variation of 12. Mauritius, Namibia and Uganda were the school systems in which the variation between schools was higher than in SACMEQ countries as a whole, where the variation within schools was 63 and between schools was 37.

## **8.2 TEACHER AND PUPIL PERFORMANCE IN MATHEMATICS IN SACMEQ II TESTS IN MOZAMBIQUE AND IN SACMEQ COUNTRIES**

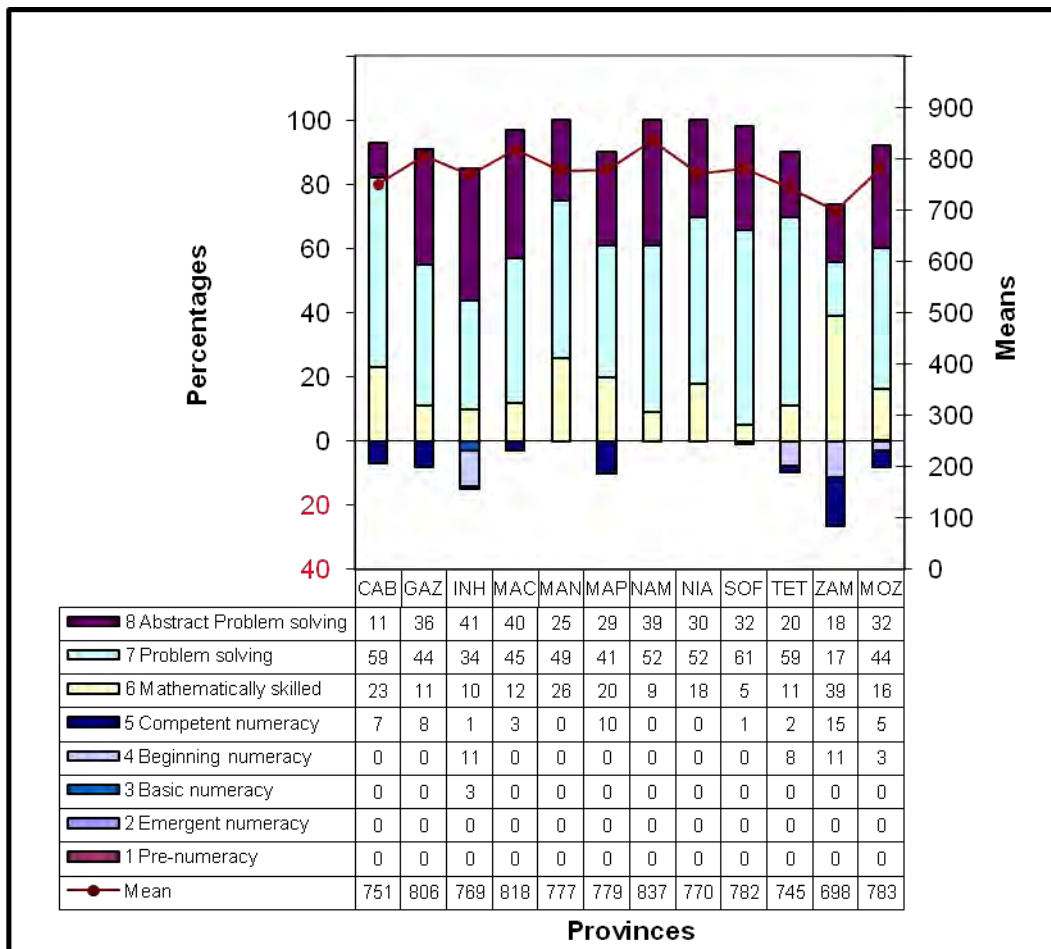
Teachers and pupil performance in mathematics in Mozambique and in other SACMEQ countries is presented analysed and discussed in this section at national, provincial level and regional level.

### **8.2.1 Teacher and Pupil Performance in Mathematics in Mozambique and in SACMEQ Countries**

As with the previous section describing teacher and pupil performance in reading, the following section presents, analyses and discusses teacher and pupil performance in mathematics firstly in Mozambique, and then in SACMEQ countries.

#### **Teacher performance in mathematics in Mozambique**

Figure 8.17 shows the percentage and means for mathematics test scores of Grade 6 teachers in Mozambique (see Appendix 39 for more information).



Source: SACMEQ database, 2004

Figure 8.17 Percentage of teachers, mean scores and attained mathematics levels of Mozambican mathematics teachers

In terms of the national average (782.8), the mathematics teachers fell 217.2 points below the maximum score of 1000 and 8.9 points above the SACMEQ mean. Some variations between provinces were recorded, with scores ranging from 837.1 in Nampula to 697.9 in Zambézia. Nampula province had the best teacher performance in Mathematics (837.1), followed by Maputo Cidade (817.6) and Gaza province (805.7).

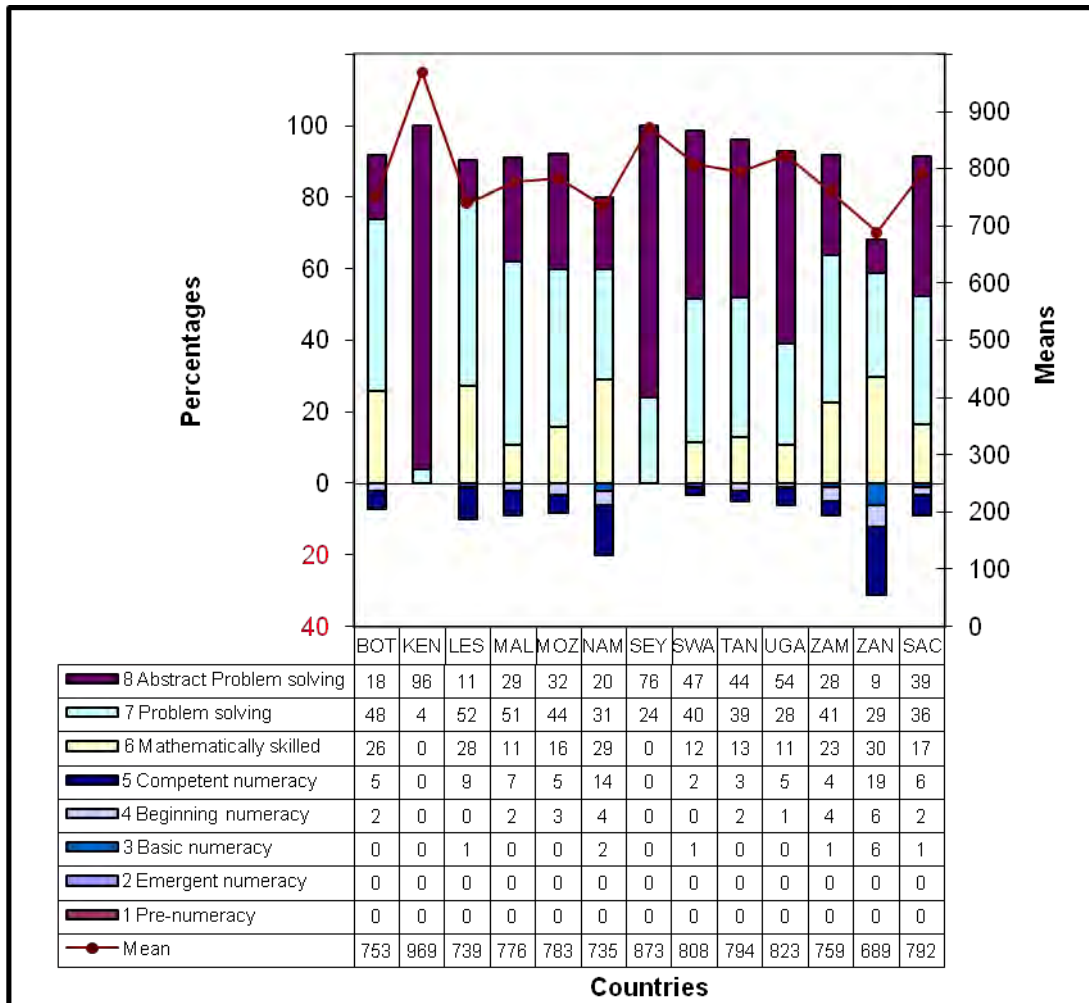
Examining the levels reached by mathematics teachers, it can be seen that 7.8% of the mathematics teachers in Mozambique reached between Levels 3 (basic numeracy) and 5 (competent numeracy). Some 16% of the teachers performed at Level 6, meaning that they can be regarded as “mathematically skilled.” Only 31.7% of pupils were taught by teachers who performed at Level 8. Those teachers who reached the highest level of performance in the test, Level 8, which involves “abstract problem solving,” varied from 10.6% in Cabo Delgado to 40.8% in Inhambane.

Comparing the performance outcomes of the teachers of mathematics and reading, it can be seen that more than half (52%) of Mozambican reading teachers reached the highest level (Level 8, “critical reading”) while only a third (32%) of mathematics teachers reached the highest level. However, mathematics teachers achieved a higher mean of 783 in comparison with the reading teachers’ mean of 716. Inhambane province had 41% of its mathematics teachers reach Level 8, the highest percentage in the country, while only 36% of the province’s reading teachers reached Level 8. Two provinces recorded vast differences between the performance of teachers who reached Level 8 for reading and Level 8 for mathematics. Maputo Province recorded 71.7% for reading and 28.8% for mathematics, and in Cabo Delgado 48.5% was recorded for reading and 10.6% for mathematics. However, in the rest of the provinces the percentage of reading teachers reaching the highest levels was greater than the percentage of mathematics teachers who reached the highest levels.

Taking into consideration that the performance of mathematics teachers was conceptually weaker than that of reading teachers in terms of the levels reached by the teachers, it may be assumed that the mathematics performance of their pupils would be influenced by teacher performance in a similar manner to reading (see Sections 8.1.1, 8.1.2, 8.2.1 and 8.2.2).

### **Teacher performances in mathematics in SACMEQ countries**

Figure 8.18 shows the percentage and means of the achievement of mathematics teachers in all SACMEQ countries (see Appendix 40). It can be seen that the average teacher’s score for mathematics in the SACMEQ countries was 791.7, which was 208.3 points below the maximum score. There were some variations between countries, ranging from the lowest mean score of 689.3 in Zanzibar, which was 102.4 points below the SACMEQ II mean, to the highest of 968.5 in Kenya, 176.8 points above the SACMEQ II mean. Mathematics teachers in Kenya, the Seychelles, Swaziland, Tanzania and Uganda performed above the SACMEQ II mean while mathematics teachers in the remaining countries performed below the SACMEQ II mean.



Source: Data from SACMEQ database, 2004

Figure 8.18 Percentage of teachers' mean scores and attained mathematics levels of regional mathematics teachers

In terms of levels reached by mathematics teachers, it can be observed from the results that in the SACMEQ countries, 8.9% of pupils were taught by teachers who managed to perform only between Level 3 (“basic numeracy”) and Level 5 (“competent numeracy”), but 35.8% of pupils were taught by teachers who reached the “mathematically skilled” Level 6, while just over a third (38.6%) of teachers reached the highest level of 8, which involves “abstract problem solving”.

The percentage of mathematics teachers that reached Level 8 vary and ranged from 9.3% in Zanzibar to 95.6% in Kenya. Zanzibar was a country with the highest percentage of pupils (31.8%) that had teachers who only managed to perform between Levels 3 and 5, followed by Namibia at 19.9% and Lesotho at 10.3%. The situation in these countries is therefore quite worrying, as this large percentage of sub-optimally skilled teachers can impact negatively on pupil achievement. Kenya had the highest mathematics teacher performance, followed by the Seychelles (75.9%) and

Uganda (54.2%), with less than 50% of teachers performing at Level 8 in the remaining countries. In fact, Kenya and the Seychelles were the only countries where mathematics teachers reached Levels 7 and 8, the ability to problem solve both concretely and abstractly.

Kenya was the only country that had a higher percentage of mathematics teachers (95.6%) who reached Level 8 than reading teachers (93.5%). In the remaining countries, the percentage of mathematics teachers who reached Level 8 is lower than the percentage of reading teachers who reached Level 8. Botswana (82%; 18.4%), Zambia (82.4%; 28.3%) and Lesotho (59.8%; 10.6%) were the three countries where the difference between the performances of reading teachers who reached Level 8 is substantial. It is interesting to note that those particular countries used the same teacher to teach both of the subjects. Possibly the difference in terms of performance is related to the level of subject knowledge required to teach the subject. The Ministries of Education in those countries need to conduct research to find out the reasons for these differences in terms of teacher performance in reading and mathematics.

Despite the higher mean reached by mathematics teachers (791.7) in comparison with the mean reached by reading teachers (733.8), the percentage of pupils taught by teachers that reached Level 8 in each subject was higher for reading teachers than for mathematics teachers. For instance, 64.9% of pupils were taught by reading teachers who performed at Level 8 in contrast to 38.6% of pupils who were taught by mathematics teachers performing at Level 8. The difference in terms of teacher performance may have influenced the pupil performance, as can be seen later in this chapter, when analysis of the pupil performance for these two subjects is presented.

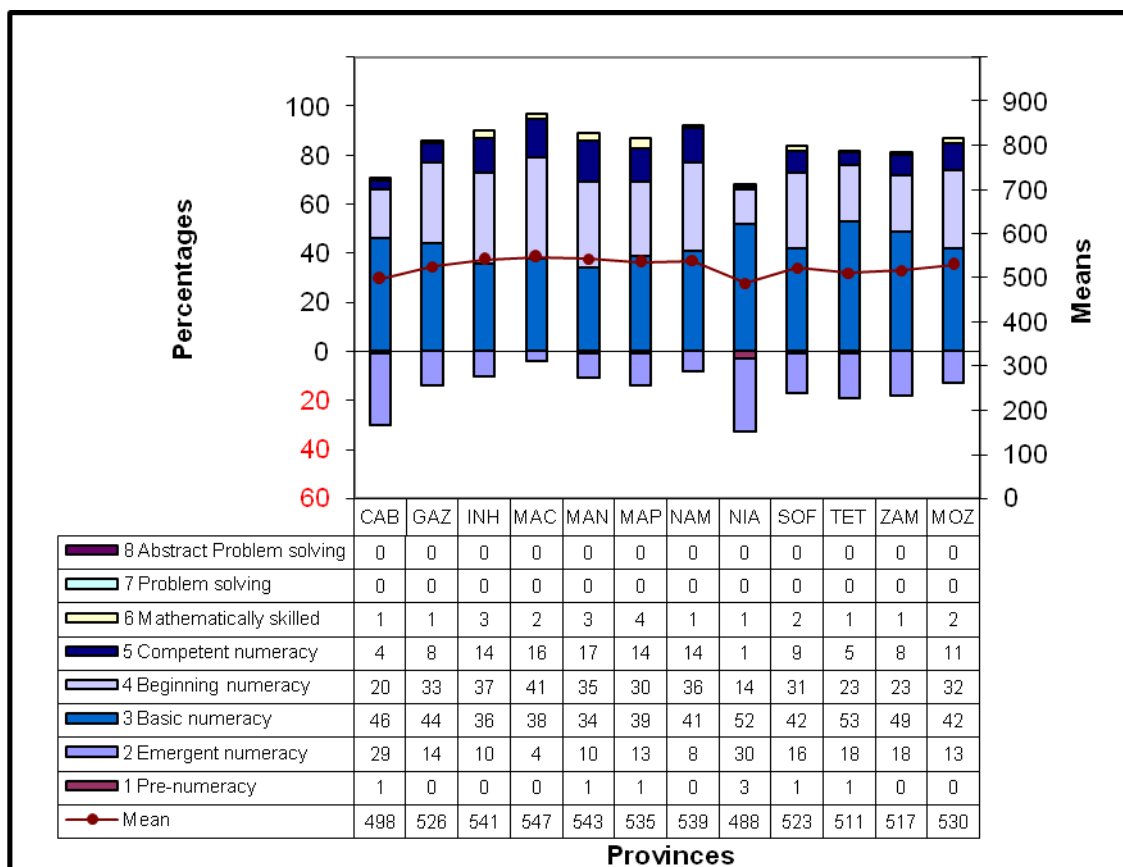
Comparing the results summarized in Figures 8.1, 8.2, 8.17 and 8.18, it can be observed that the performance of reading and mathematics teachers indicates the need to improve teachers' subject knowledge, particularly in mathematics. However, it is important to stress that just as seen in Mozambique, there is a need to improve the subject knowledge of teachers in SACMEQ countries in order to provide a good foundation with solid subject knowledge for teaching and learning in primary schools.

As seen in the Mozambican results, teacher performance in reading and mathematics tests in SACMEQ countries tends to indicate the need for better selection criteria for teacher training programmes. The examination to select candidates must include subject knowledge assessment and investigation into mastery of primary education content to ensure that the candidate has the knowledge required to teach successfully in primary education. It is important to take into consideration that the purpose of a teacher training course is to provide professional training for teachers in terms of Psycho-Pedagogy and Didactics rather than to provide academic knowledge,

which is the purpose of primary and secondary schools in laying down the foundation for academic knowledge. However, if the required subject knowledge were lacking, it would be necessary for teacher training colleges to organize extra sessions to improve and extend the subject knowledge of primary education student teachers and then assess this acquisition and development. Therefore, if teachers do not have the knowledge of each subject it is not possible to teach at primary level (Shulman, 1986). To be an effective teacher, the candidate must demonstrate competency in primary education subjects. Primary school subject knowledge is therefore a prerequisite for entry into a teacher training course. However, the combination of subject knowledge and professional training is important to ensure the training of effective teachers and successful teaching and learning in schools.

### Pupil performance in Mathematics in Mozambique

The means and the percentages of pupils reaching each of the eight mathematics competency levels have been presented in Figure 8.19 (see Appendix 41).



Source: SACMEQ database (2004)

Figure 8.19 Percentage of pupils' mean scores and attained mathematics levels of Mozambican mathematics pupils



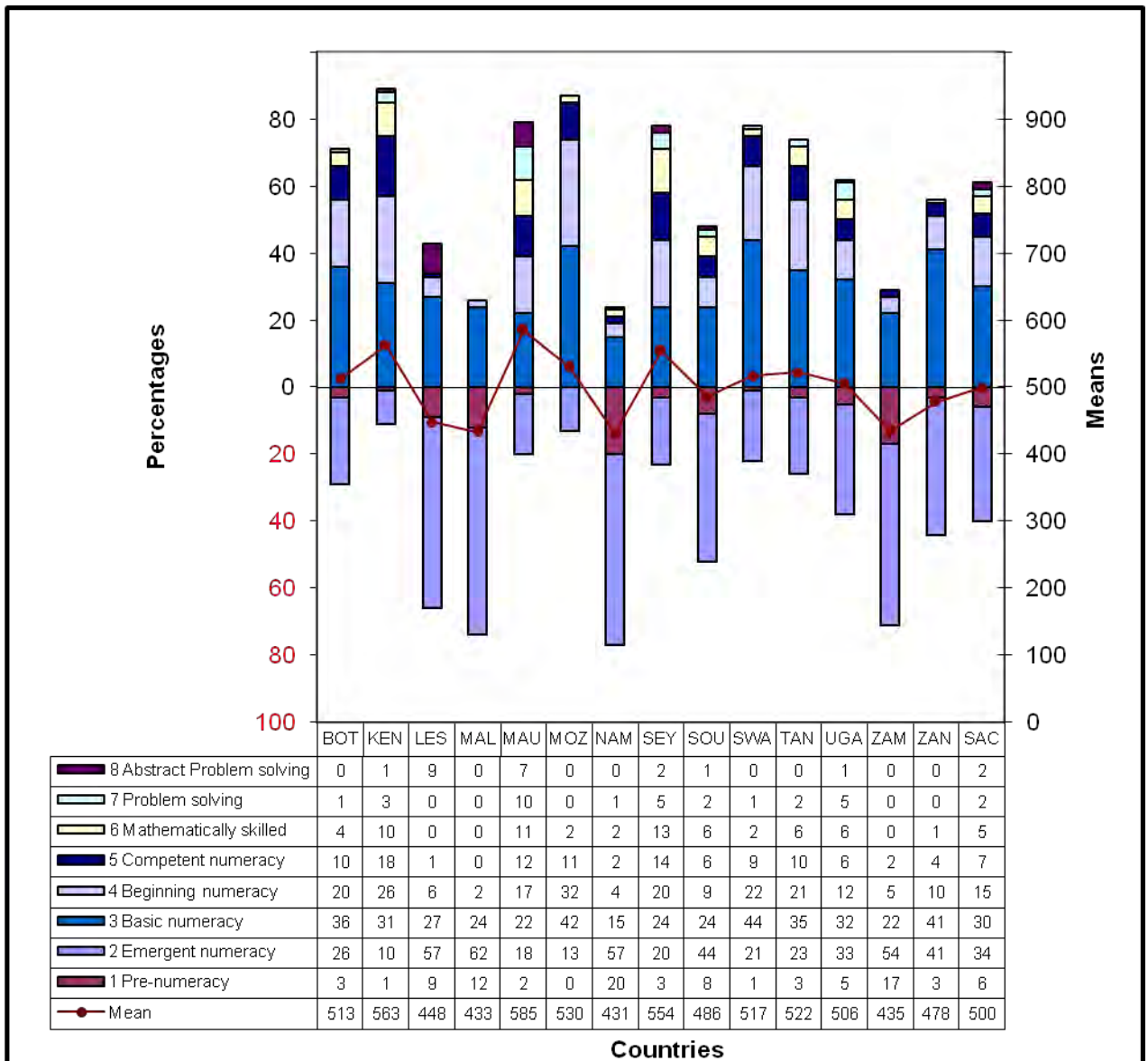
According to the adopted definition, (see, Section 8.1.1) all pupils that performed below Level 3 were considered numerically illiterate. Some 13% of the pupils in Mozambique performed at or below this level, and must therefore be considered numerically illiterate. Figure 8.19 illustrates that the Mozambican overall average of pupil performance in mathematics was 530, 30 points above the SACMEQ mean, but 470 points below the maximum score. There were some variations among the provinces, ranging from 488.2 in Niassa to 546.5 in Maputo Cidade. Inhambane (540.9), Maputo Cidade, (546.5), Manica (543.4), Maputo Provincia (534.7) and Nampula (539.2) were the provinces that performed above the country's mean. The rest of the provinces performed below the country's mean while Niassa (488.2) and Cabo Delgado (497.9) performed below the SACMEQ mean (500).

Just as in reading, the Mozambican pupils did not achieve Level 8 of "abstract problem solving" in mathematics, but 1.8% of pupils performed at Level 6 and 7. Some (41.7%) of pupils in Grade 6 reached Level 3 ("basic numeracy") and 32.1% reached Level 4 ("beginning numeracy"). However, more than half of the pupils in Grade 6 (54.7%) performed between Levels 1 and 3. There were some variations among provinces with Niassa (84.1%) and Cabo Delgado (75.8%) having the highest percentage of pupils who performed between Levels 1 and 3. The majority (41.7%) of Grade 6 pupils mastered Level 3. Maputo Cidade had the highest (41.1%) percentage of pupils that reached Level 4.

These results need special attention from the Ministry of Education and Culture and the curriculum needs to be scrutinised to ensure that abstract thinking is a skill that is developed at the primary school level. If Grade 6 pupils are unable to perform at high levels such as Levels 6, 7 and 8, which involve the development of mathematical skills, problem solving and abstract problem solving, both the curriculum and the teacher training programmes need to be adapted to incorporate the teaching and learning of these advanced skills. In addition, the SACMEQ II study reveals that 78.2% of pupils in Grade 6 in Mozambique in 2000 had repeated a grade during their school careers. The stringent selection system means that only the best performers were able to reach Grade 6. However, even these pupils did not reach Level 7 and 8 in the mathematics tests. The results, therefore, suggest that the MEC has to investigate ways to improve mathematical performance.

### **Pupil performance in mathematics in SACMEQ countries**

Figure 8.20 presents the means and the percentages of pupils reaching each of the eight mathematics competency levels (see Appendix 42 for details).



Source: Data from SACMEQ database, 2004

Figure 8.20 Percentage of pupils' mean scores and attained mathematics levels of SACMEQ countries

The average of pupils' overall performance in mathematics in all of the SACMEQ countries was 500. As indicated in Figure 8.20, some variations were observed among the countries, ranging from 430.9 in Namibia to 584.6 in Mauritius. Mauritius (584.6), Kenya (563.3), Seychelles (554.3), Mozambique (530), Tanzania (522.4), Swaziland (516.5), Botswana (512.9) and Uganda were the countries that performed above the SACMEQ mean, with the remaining countries performing below the SACMEQ mean.

The percentage of pupils reaching the various levels of competency in Mathematics is presented in the same figure. Almost three quarters (70.1%) of pupils in Grade 6 in the SACMEQ countries

performed between Levels 1 (pre-numeracy) and 3 (basic numeracy). Remembering that at Level 4 pupils are at the stage of “beginning numeracy,” one realises that 70.1% of pupils performing below this level will not have mastered beginning numeracy skills. Only 1.5% of Grade 6 pupils reached Level 8, the “abstract problem solving” level.

Some 22% of pupils reached Level 4 (beginning numeracy) and Level 5 (competent numeracy) while 6.6% reached Levels 6 (mathematically skilled) and Level 7 (problem solving). Mauritian pupils had the highest percentage of pupils that reached Levels 7 (10.4%) and 8 (7%). Figure 8.20 shows that the lowest percentages are observed at Levels 1, 5, 6, 7 and 8 and the highest percentages at Levels 2 and 3. The percentages begin to increase at Level 2 and to decline at Level 5.

There were some variations amongst the various countries. Malawi (97.8%), Zambia (92.7%), Lesotho (92.7%), Namibia (91.5%), Zanzibar (85.2%) and South Africa (76%) recorded the highest percentage of pupils that performed at Levels 1 and 3. Apart from Zanzibar, the same countries that recorded lower performance in reading also recorded lower performance in mathematics. This phenomenon needs to be examined in detail by the various Ministries of Education, taking into consideration the level of pupil performance required at Grade 6.

When comparing the SACMEQ pupil performance in reading and mathematics by country, it can be observed that pupils in Kenya, Lesotho, Malawi, Mauritius, Mozambique and Uganda performed more poorly in reading than in mathematics. This is in contrast to the rest of the countries, whose pupils performed better in reading than in mathematics.

In terms of the achieved levels, pupils generally reached higher levels in reading than in mathematics. For instance, if information is combined and grouped into four levels for each of reading and mathematics the following picture emerges:

Categories	% of pupils performing within each category	
	Reading (%)	Mathematics (%)
1	40.0	70.1
2	37.0	22.0
3	19.0	6.6
4	3.7	1.5

The majority of the pupils in the two subjects performed within Categories 1 (40%; 70.1%) and 2 (37%; 22%) respectively in reading and mathematics and 3.7% of pupils in reading and 1.5% percent in mathematics achieved performance in Category 4.

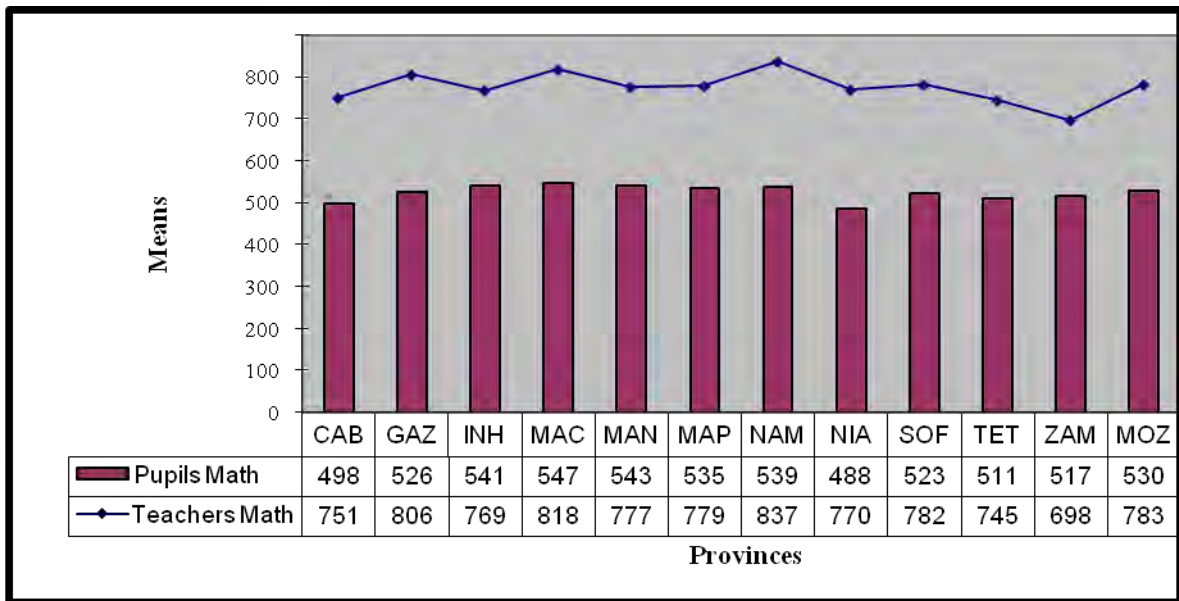
Reading is a determinant for pupil performance in other subjects in primary education. In mathematics, problem solving implies two kinds of knowledge. Firstly, it involves reading, interpretation and understanding, and then, secondly, it requires mathematical knowledge to solve the problem. Sometimes mathematical difficulties are related to language problems rather than mathematics itself. As evidence, a study carried out in India shows that “there was a positive association between the mean percentage score of districts in language and mathematics. The correlation between the two being 0.73. Thus, the districts with a high achievement level in mathematics also depict high achievement level in language” (Aggarwal, 2000, p. 9).

### **8.2.2 Teacher and Pupil Performances in Mathematics in Mozambique and in SACMEQ Countries**

This section presents and discusses teacher and pupil performance in mathematics in Mozambique and in SACMEQ countries.

#### **Teachers and pupil performances in mathematics in Mozambique**

Figure 8.21 shows the percentage and means for mathematics test scores of Grade 6 teachers and pupils in Mozambique (see Appendix 43 for more information).

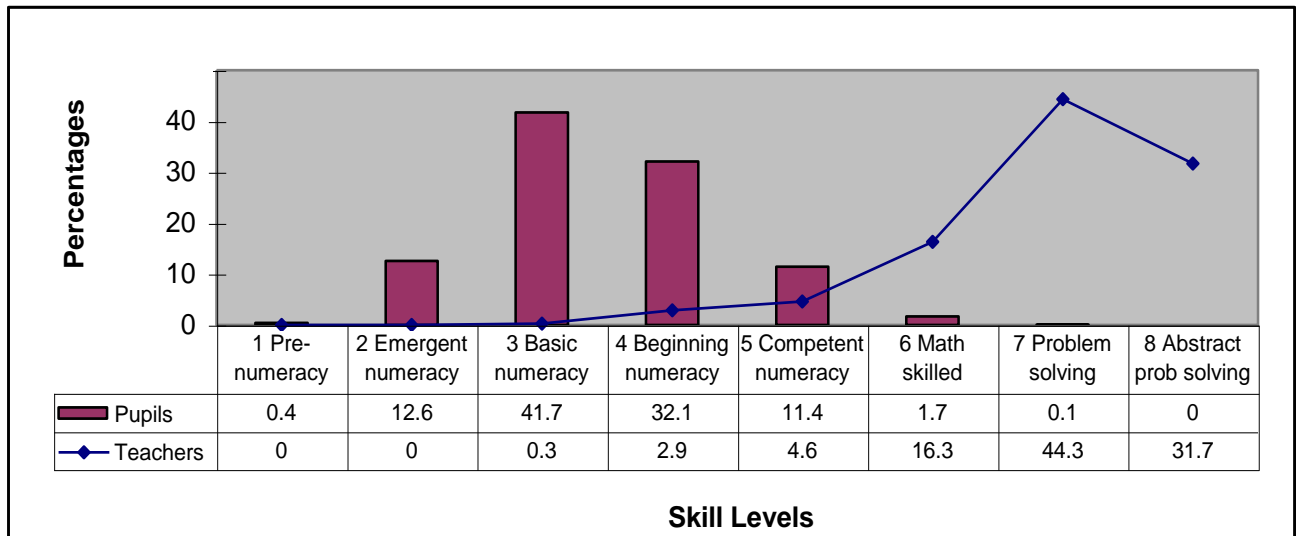


Source: Data from SACMEQ database, 2004

*Figure 8.21* Mean scores of reading pupils and teachers in Mozambique

Figure 8.21 shows that on average teachers performed better in mathematics (782.8) than their pupils, who had 530 points in mathematics. A variation among provinces is seen, in comparing the differences between teachers and pupils' performance. The difference between teachers and pupils in terms of performance in mathematics, ranged from 181 in Zambézia to 298 in Nampula.

Figure 8.22 shows teachers and pupils' performance in the different mathematics competency levels in Mozambique (see Appendix 44).



Source: Data from SACMEQ database, 2004

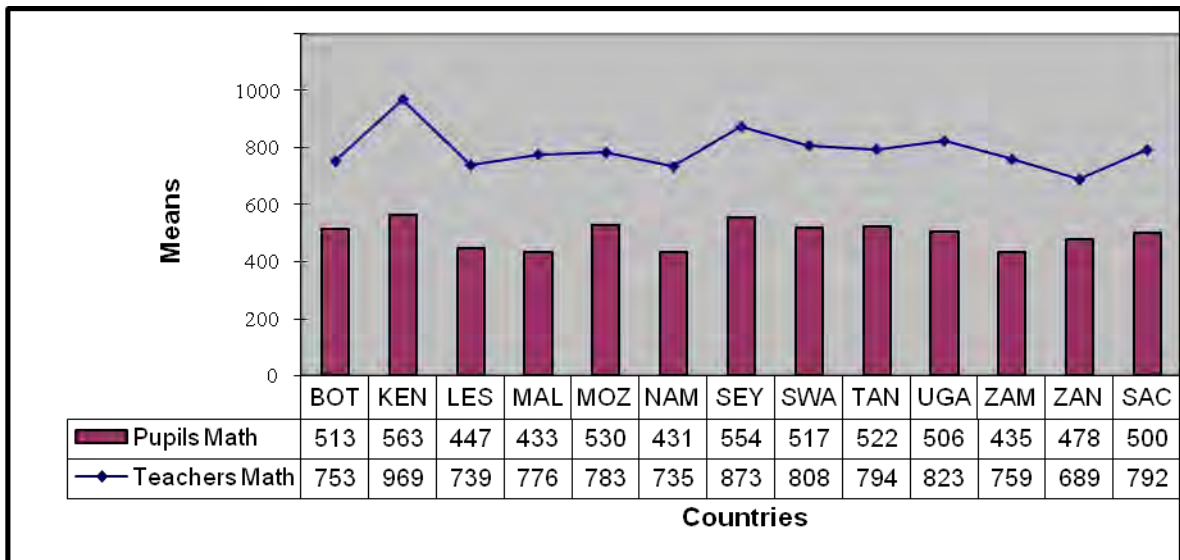
*Figure 8.22* Percentage of Mozambican teachers and pupils' performance in mathematics at different levels of competency

Figure 8.22 presents pupils and teachers' performance in mathematics tests. Whereas pupils' performance decreased at Level 5, the teachers' performance increased significantly from Level 5 (competent numeracy) to Level 8 (abstract problem solving).

In the case of Mozambican pupils, the lowest percentages can be observed at Levels 1, 6, 7 and 8 and the highest percentages at Levels 3 and 4 (beginning numeracy). The percentages begin to increase at Level 2 and decline at Level 5. In the case of teachers, the lowest percentages can be observed at Levels 1, 2, 3, 4 and 5 and the highest percentages at Levels 7 (problem solving) and 8 (abstract problem solving).

### **Teacher and pupil performances in mathematics in SACMEQ countries**

Figure 8.23 shows teacher and pupil performance in the different mathematics competency levels in SACMEQ countries (see Appendix 45).



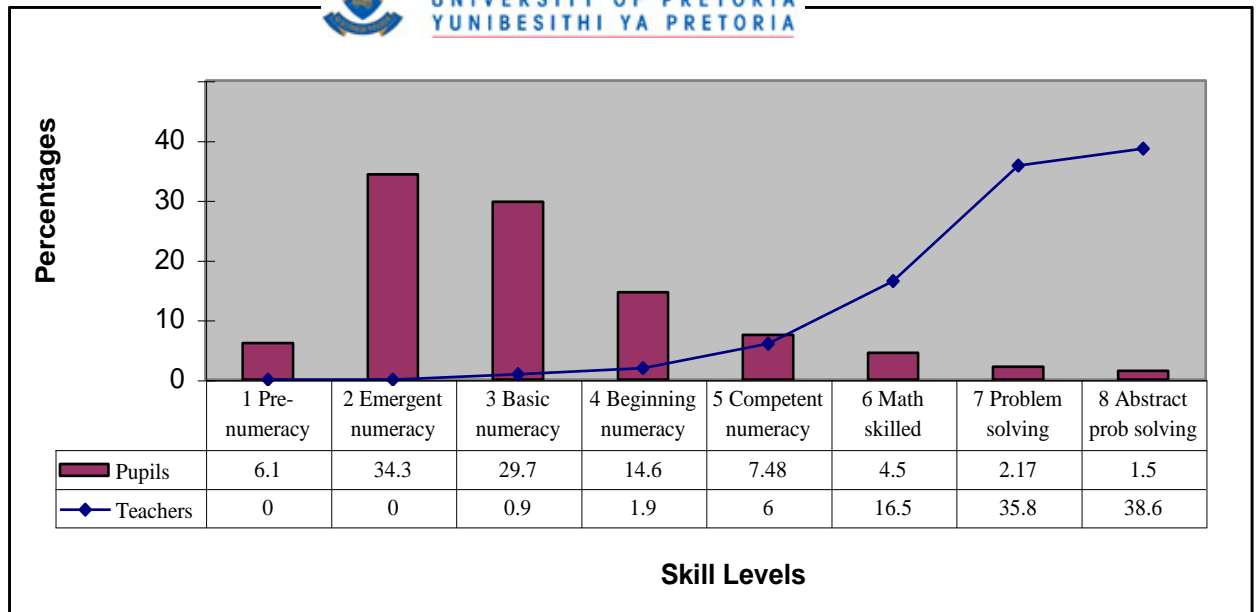
Source: Data from SACMEQ database, 2004

*Figure 8.23* Mean scores of reading pupils and teachers in SACMEQ countries

As in reading, teachers in the SACMEQ countries performed on average higher than their pupils, achieving a mean of 791.7 in mathematics. The variation in terms of pupil performance in mathematics ranged from 431 for pupils and 735 for in Namibia to 563 for pupil and 969 for teachers in Kenya.

Figure 8.24 shows teacher and pupil performance at different mathematics competency levels in the SACMEQ countries (see Appendix 46).





Source: Data from SACMEQ database, 2004

*Figure 8.24* Percentage of SACMEQ teachers and pupils' performance in mathematics at different levels of competency

Figure 8.24 illustrates a similar pattern in that teacher performance in reading increases where pupil performance decreases. This result means that pupil performance decreased at Level 5 and teacher increased at Level 5 (competent numeracy).

In the case of pupils in the SACMEQ countries, the lowest percentages can be observed at Levels 1, 6, 7 and 8 and the highest percentages at Levels 2 and 3 (basic numeracy). The percentages begin to increase at Level 2 and decline at Level 5. In the case of teachers, the lowest percentages can be observed at Levels 1, 2, 3, 4 and 5 and the highest percentages at Levels 7 (problem solving) and 8 (abstract problem solving).

It was expected that teachers would perform better in the SACMEQ tests. Teacher performance varied from 654 to 969, with Kenyan teachers performing the best and the teachers from the remaining countries performing below 900.

Pupils and teachers performed better in mathematics than in reading, but their performance on the eight competency levels is higher in reading than in mathematics in both Mozambique and in the other SACMEQ countries. This result means that both pupils and teachers were able to solve more items in the mathematics test; however, although the mean for reading is lower, as pupils and teachers solved fewer items, they were able to reach higher competency levels in reading.

Figures 8.5, 8.7, 8.21 and 8.23 seem to show that when teachers achieved higher performance in the reading and mathematics tests, their pupils tended also to achieve a higher performance. When teachers achieved at a lower performance level, pupils tended to also only achieve at a lower level. This illustrates that in Mozambique as well as in SACMEQ countries, teacher and pupils *move together* (SACMEQ presentation, Passos, 2007) or that the teachers' performance mirrors that of their pupils.

It seems that the performance of pupils was determined by teacher performance in Mozambique as well as in other SACMEQ countries, because the pattern of teacher performance and the pattern of pupil performance generally followed a similar tendency. The results of the study have raised many issues that have serious implications for quality improvement in primary education. There is clear evidence to suggest that in SACMEQ countries, pupil performance levels tend to drop as the difficulty level increases. The results suggest that policies and interventions must be improved in order to close the poor performance of pupils and teachers in different levels of competency. Ministries of Education should therefore undertake continuous and comprehensive analysis of pupil and teacher performance at low and upper primary schools to address this concern. An integrated approach is required, to improve teacher and pupil performance and to take into account all of the variables involved, such as teacher training, assessment, inspection, and school conditions, just to mention a few.

### **8.2.3 Pupil Performance in Mathematics by Gender, Socio-economic Status and School Location in Mozambique and in SACMEQ Countries**

In order to find out the impact of other factors on pupil performance, the following section presents and discusses pupil performance in mathematics by gender, socio-economic status and school location in Mozambique and in other SACMEQ countries.

As in reading, to analyse the mathematics results relating to gender, socio-economic status and school location, the eight levels were reduced and combined into four categories, in accordance with the Mozambican marking scale, and will be classified as: Category 1 poor, Category 2 fair, Category 3 good, and Category 4 very good:

#### **In mathematics, the categories are as follows:**

Category 1 comprises Levels 1 “pre-numeracy”, 2 “emergent numeracy” and 3 “basic numeracy”

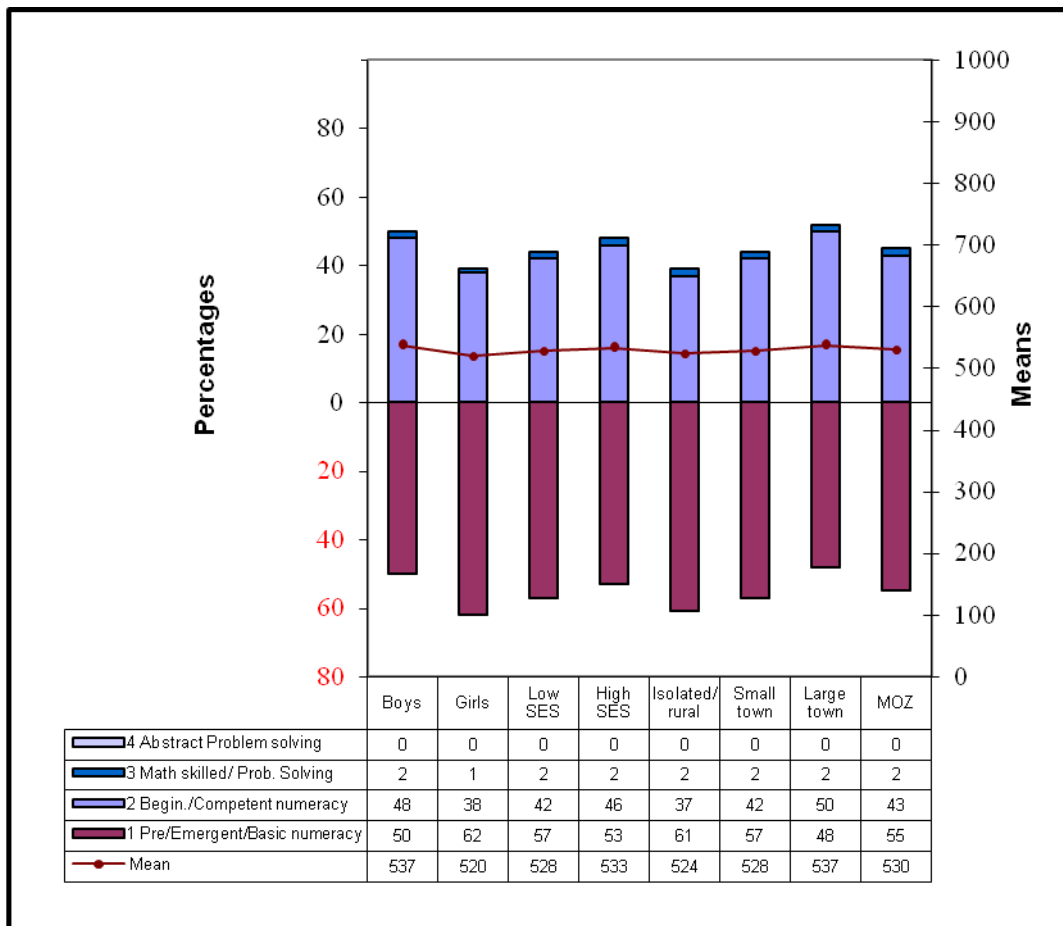
Category 2 comprises Levels 4 “beginning numeracy” and 5 “competent numeracy”

Category 3 comprises Levels 6 “mathematically skilled” and 7 “problem solving”

Category 4 comprises Level 8 “abstract problem solving”.

**Pupil performance in mathematics by gender, socio-economic status and school location in Mozambique**

Figure 8.25 shows the mathematics performance of pupils according to means and percentages in different levels of competency and according to their gender, socio-economic status and school location (more details in Appendix 47).



Source: SACMEQ database, 2004

*Figure 8.25* Percentage of pupils’ mean scores and attained mathematics categories of Mozambican mathematics pupils by gender, socio-economic status and school location

Figure 8.25 illustrates that all of the means in the three sub-groups were higher than the SACMEQ mean (500), but there were a few differences between them in terms of the means and the categories achieved by the pupils. The boys performed better than the girls (537; 519.5) in mathematics, and pupils from a higher SES performed better than pupils from a lower SES (527.5;

532.6), while pupils from large towns performed better than pupils from isolated or rural areas and small towns (524.0; 527.5 and 536.7) respectively.

The same figure shows the mathematics performance of pupils in different categories of competency, according to their gender, socio-economic status and school location. On average, more than half of the pupils (55%) in Mozambique performed within Category 1, with only 1.7% performing at Level 3 and 0% of pupils reaching Level 4. A larger percentage of girls than boys in Mozambique attained only Category 1 (61.5%: 50%), and only 2.4% of boys and 1% of girls performed within Category 3.

Figure 8.25 also reveals that 56.8% of pupils from low SES and 52.5% of pupils from high SES reached Category 1 in Mathematics. 1.5% of pupils from low SES performed within Category 3, while 2% pupils from high SES reached Category 3 and 41.6% of pupils from low SES and 45.5% from high SES reached Category 2.

In terms of school location, 60.6% of pupils from isolated/rural areas, 56.7% of pupils from small towns and 48.3% of pupils from large towns reached Category 1. 2.1% of pupils from isolated or rural and 1.5% from large towns reached Category 3; while 1.6% of pupils from small towns performed the level of Category 3. 37.3%, 37.3%, 41.8% and 50.1% of pupils respectively from isolated or rural areas, small towns and large towns reached Category 2.

In terms of gender, the boys performed better than the girls in both subjects. The boys achieved 537 points on average as against the 520 points average achieved by girls in mathematics, and the boys achieved 518 points in reading as against the girls' 514 points. The differences between boys and girls were greater in mathematics (17 points) than in reading (4 points).

Pupils from low SES groups recorded a weaker performance than their counterparts from higher SES groups. For instance, the differences in the mean reading score rose by 12 points, while in mathematics there was a five-point difference in mean score.

In relation to school location, pupils living in large towns had the highest mean performance (537), followed by pupils in small towns (528) and lastly pupils from isolated or rural areas, who had the lowest performance (524). There was a 13-point difference in the mean score in mathematics between pupils living in large towns and isolated/rural areas, and a 31-point difference between these same pupils in reading. The differences observed in the performance of pupils according to SES and school location in terms of reading are perhaps related to the accessibility of books at home and school, as confirmed by cross-international studies. In fact, according to Postlethwaite

and Ross (1992), student scores on reading literacy tests correlate with the composite (use of test language at home, home possessions, number of meals per week and number of books at home). The PISA study (2005) confirms the same findings in referring to the positive effects of home possessions and socio-economic status in reading achievement. In terms of school location, similar results were found in a study conducted in 1983 when the MEC introduced the national system of education (SNE). The study (INDE, 1984) revealed an eight percent difference in school achievement between pupils in rural areas and pupils in urban areas.

As previously stated, pupils achieved higher levels in reading than in mathematics. However, it is strange that even pupils from large towns or higher SES had the level of performance presented in Figures 8.9 and 8.25. In mathematics, for example, 52.5% of pupils from higher SES and 48.3% of pupils from large towns performed at Level 3 or under. One would assume that the level of SES, school location, and the gender of pupils would be a positive factor in pupils' achieving Levels 7 and 8. However, this strong performance did not occur and Grade 6 pupils in Mozambique were unable to achieve these levels of performance, a result which was confirmed in a study conducted in lower primary schools in Mozambique (Passos and Otto, 1992). This study tested students in two schools with differing SES (3 de Fevereiro higher SES and Zimpeto low SES), and recorded that 44% of the pupils in both schools could read. However, the differences are evident in relation to pupils who cannot read, with 6% in 3 de Fevereiro and 39% in Zimpeto being unable to do so (Passos and Otto, 1992). This contrast may mean that schools that are poorly resourced and are situated in poorer economic areas find it difficult to develop and encourage reading in their pupils.

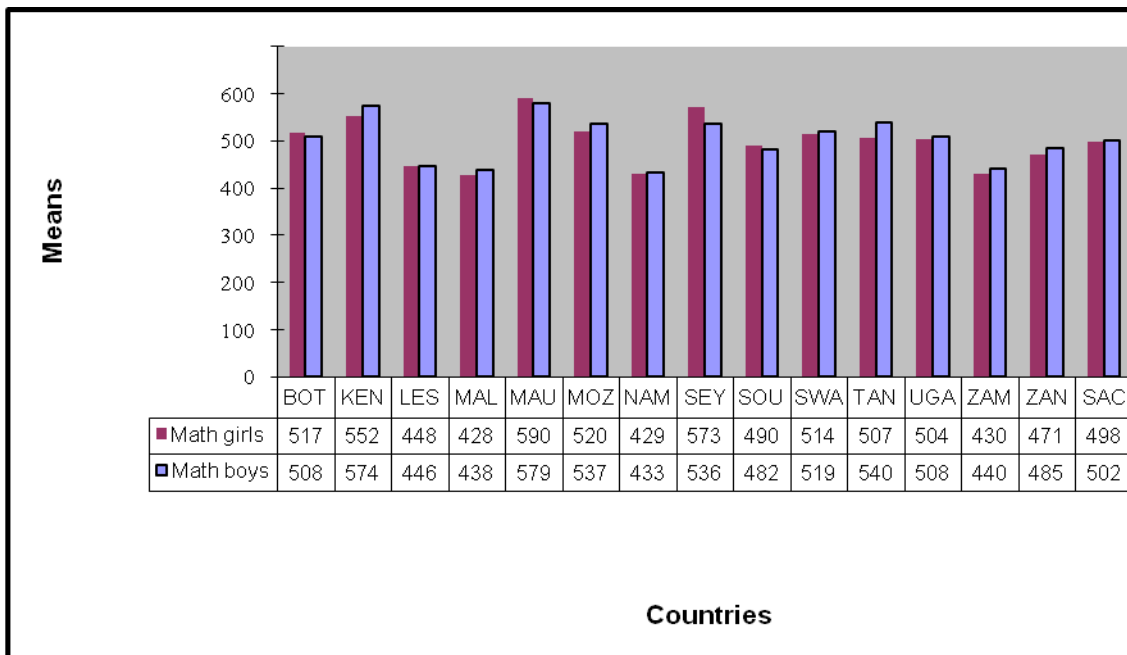
In contrast, other studies have recorded significant differences between the performance of pupils with high and low socio-economic status:

The fact that pupils living in Sommerchild, Polana and Coop have presented better achievement, confirms the existing relationship between achievement and socio-economic level. The parents of pupils that live in these quarters have better socio-economic levels than those living in Malhangalene, Polana Caniço or Urbanização (Passos, 1995, p.79).

Despite the differences observed in Figures 8.9 and 8.25 in terms of means and levels reached by pupils, Mozambique is the SACMEQ country that had the best equity, according to SACMEQ II. This idea of equity means that Mozambique does not have variation within schools and between schools in terms of pupil performance with regard to SES and school location, and this outcome is an issue to ponder over, as the literature stresses that these variables can have an effect on pupil performance.

**Pupil performance in mathematics by gender in SACMEQ countries**

Figure 8.26 shows pupil performance in mathematics by gender (for more information see Appendix 48).



Source: Data from SACMEQ database, 2004

*Figure 8.26* Mean scores of mathematics pupils of SACMEQ countries by gender

Figure 8.26 shows that in the SACMEQ countries, on average, boys performed better in mathematics (501.7) than in reading (494.6), while girls in Botswana, Lesotho, Mauritius, Seychelles and South Africa performed better in mathematics than boys. But in Tanzania boys performed better than girls in reading (554.3) and in mathematics (540).

Figure 8.27 presents pupil results by gender in the SACMEQ countries on the combined mathematics competency levels (see Appendix 49).

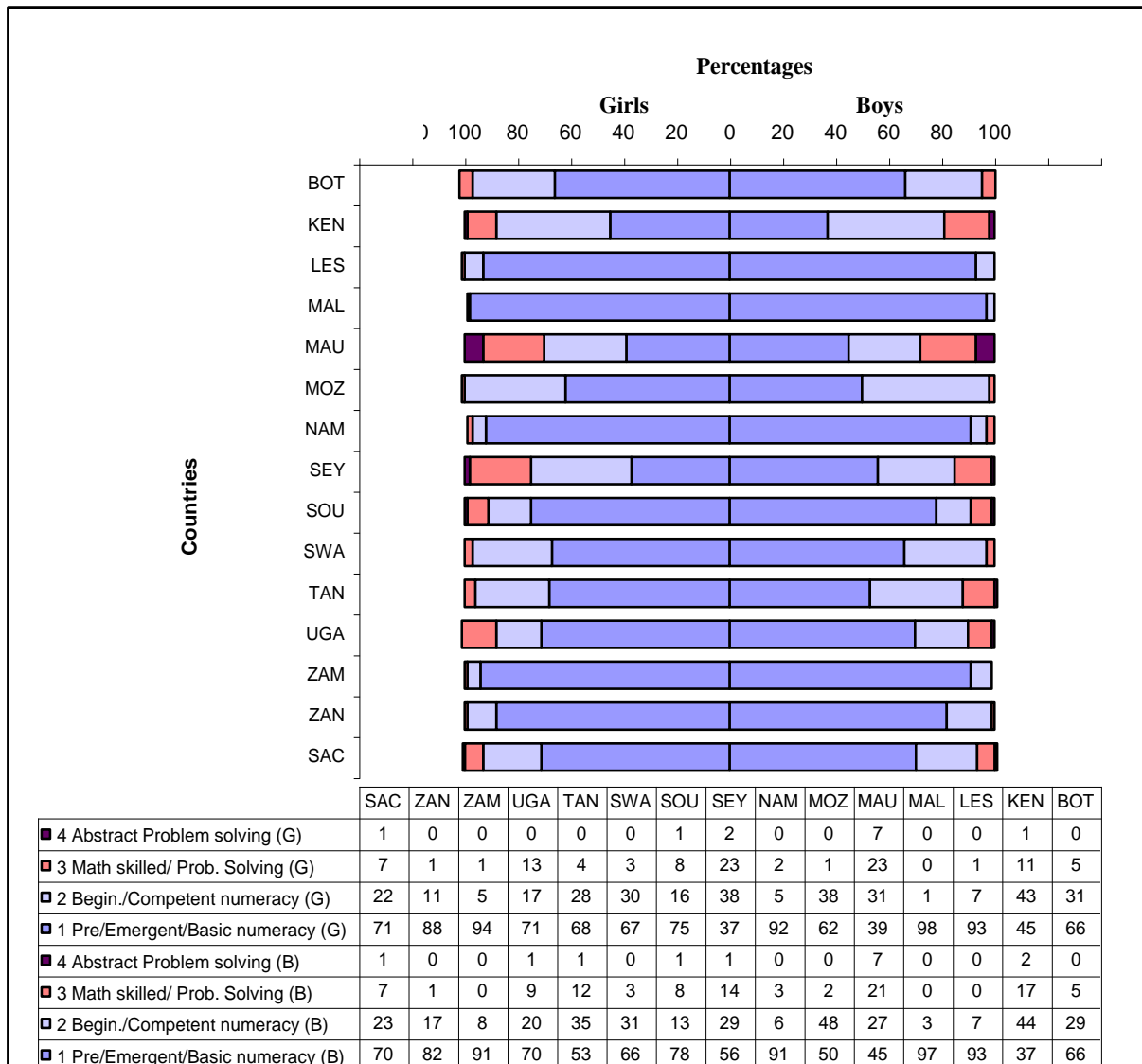


Figure 8.27 Percentage of pupils' mathematics categories in SACMEQ countries by gender

As evidenced in Figure 8.27 above, more pupils have only performed in the lower categories in mathematics than in reading. On average, there is little difference between boys and girls. For instance, on average 69.6% of boys and 71% of girls performed at Category 1 and 22.5% of boys and 21.5% of girls reached Category 2, while 6.7% of boys and 6.7% girls reached Category 3. Finally, only 0.9% of boys and 0.8% of girls performed in Category 4.

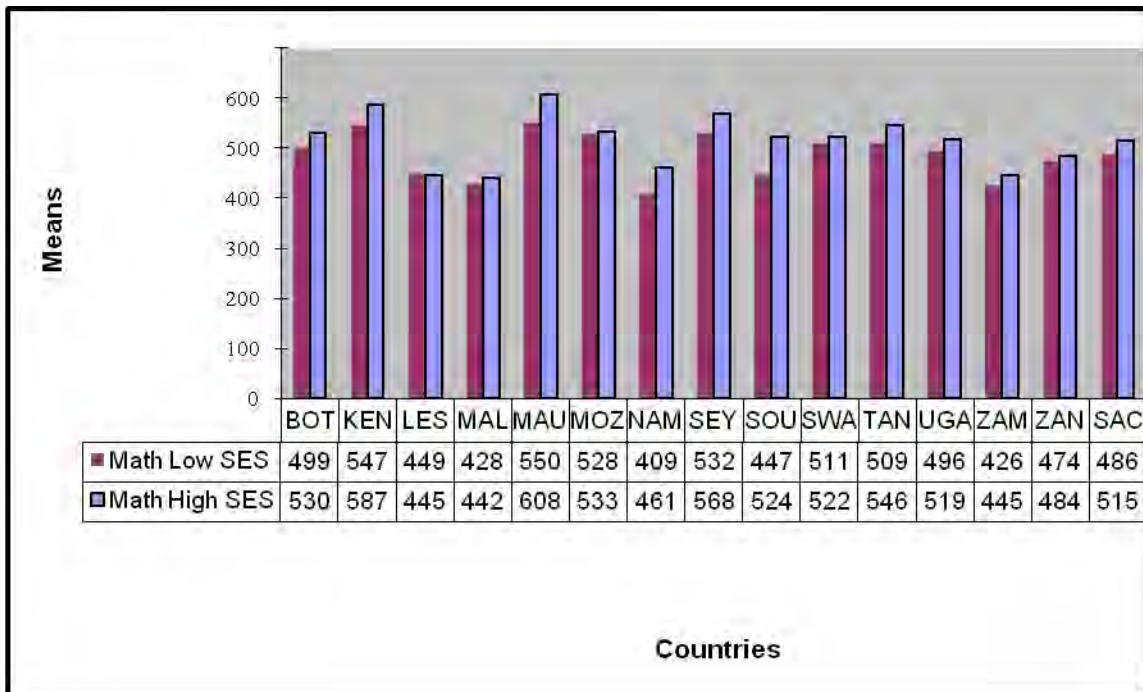
Mauritius was the only country with a high percentage of girls and boys alike reaching the upper categories. For instance, 22.6% and 6.7% of girls and 20.8% and 7.3% of boys performed at Categories 3 and 4 respectively. Malawi was the country where the most boys (97.1% and 3%) and girls (98.5% and 1.4%) performed in the lowest categories of 1 and 2.



It can also be observed that among the girls that reached Category 2, the variation ranged from 38% in Seychelles to 1.4% in Malawi, whilst for boys in the same category, the variation ranged from 47.6% in Mozambique to 6% in Namibia. In Category 3, the variation ranged from 23.1% in Seychelles to 0% in Malawi for girls, and for boys the variation ranged from 20.8% in Mauritius to 0% in Malawi. In Mauritius, boys (7.3%) and girls (6.7%) reached the highest category, while no pupils in Mozambique, Malawi, Lesotho and Zanzibar were able to reach Category 4.

### Pupil performance in mathematics by socio economic status

Figure 8.28 shows SACMEQ pupil performance in mathematics according to socio-economic status (see Appendix 50).



Source: Data from SACMEQ database, 2004

*Figure 8.28* Mean scores of mathematics pupils of SACMEQ countries by socio-economic status

Figure 8.28 shows that, on average, pupils from a low SES had 486 points in mathematics, while pupils from a high SES had 515.2 points in mathematics. This figure demonstrates that in the SACMEQ countries, on average, pupils from a low SES scored much lower in mathematics than pupils from a high a SES. The exception is in Lesotho, where interestingly pupils from a low SES performed better in mathematics (448.6) than pupils from a high SES (444.9).



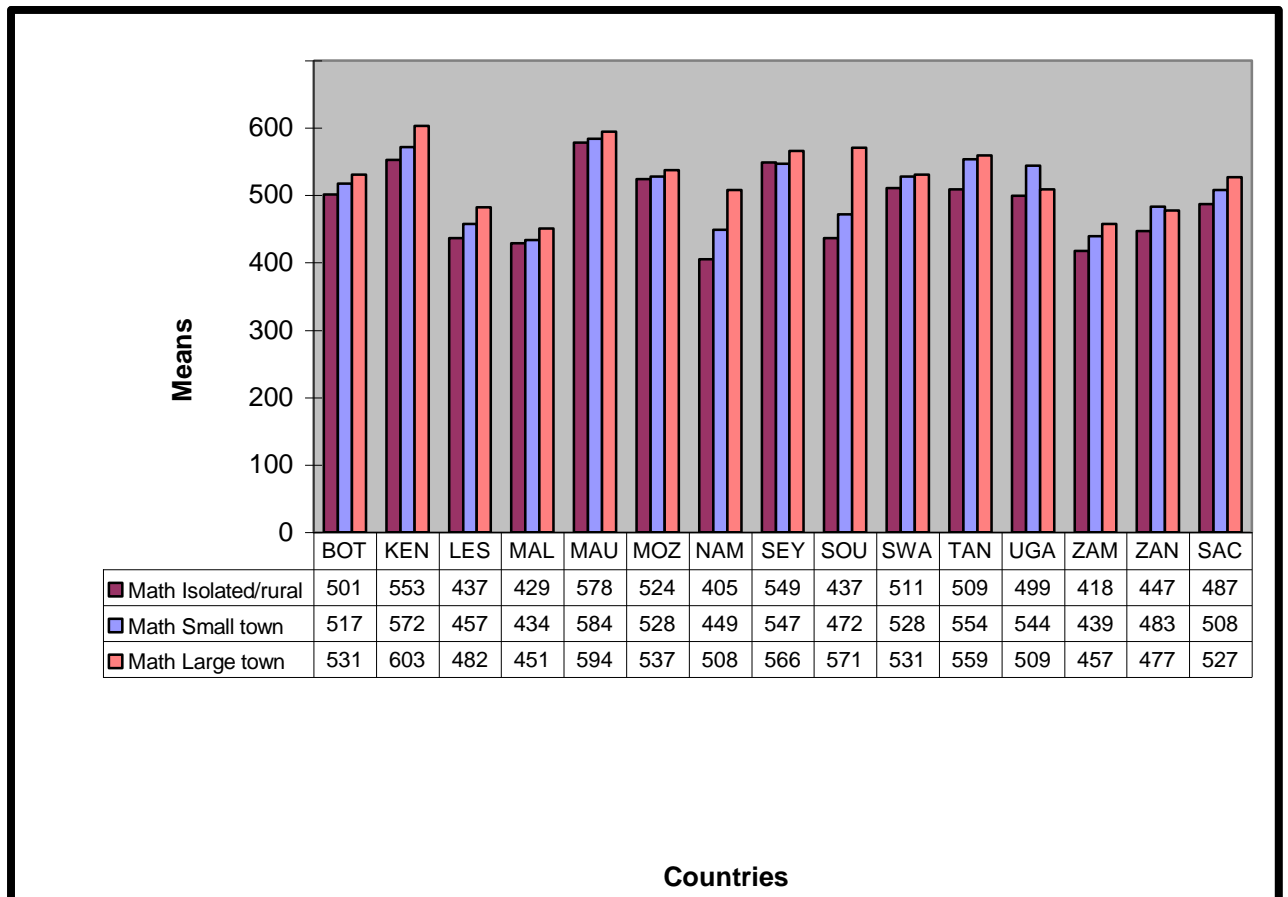
lower SES respectively reached Category 2. A further 9.3% of pupils from a higher SES and 4.2% from a lower SES reached Category 3. Finally, 1.3% of pupils from a higher SES and 0.4% from a lower SES reached Level 4.

In Mauritius 9.4% of pupils from a higher SES and 3.6% from a lower SES reached Category 4 while in Botswana Namibia, South Africa, Swaziland and Zambia pupil from lower SES did not reached Category 4. Lesotho, Malawi, Mozambique and Zanzibar were the countries where pupils from higher and lower SES that did not reached the highest category.

Among pupils from a higher SES that reached Category 1, the variation ranged from 96.5% in Malawi to 31.7% in Kenya, and among pupils from a lower SES, the variation ranged from 98.4 in Namibia and Malawi to 51% in Mauritius. Among pupils from a higher SES that reached Category 2, the variation ranged from 45.5% in Mozambique to 3.6% in Malawi, while for pupils from a lower SES in the same category the variation ranged from 42.6% in Kenya to 1.4% in Namibia. In Category 3, the variation ranged from 26.2% in Kenya to 0% percent in Malawi for pupils from a higher SES, and for pupils from a lower SES the variation ranged from 14.8% in Mauritius to 0% in Malawi, Mozambique and Zambia.

### **Pupil performance in mathematics by school location**

Figure 8.30 shows the mean performance of pupil mathematics according to school location (see Appendix 52).



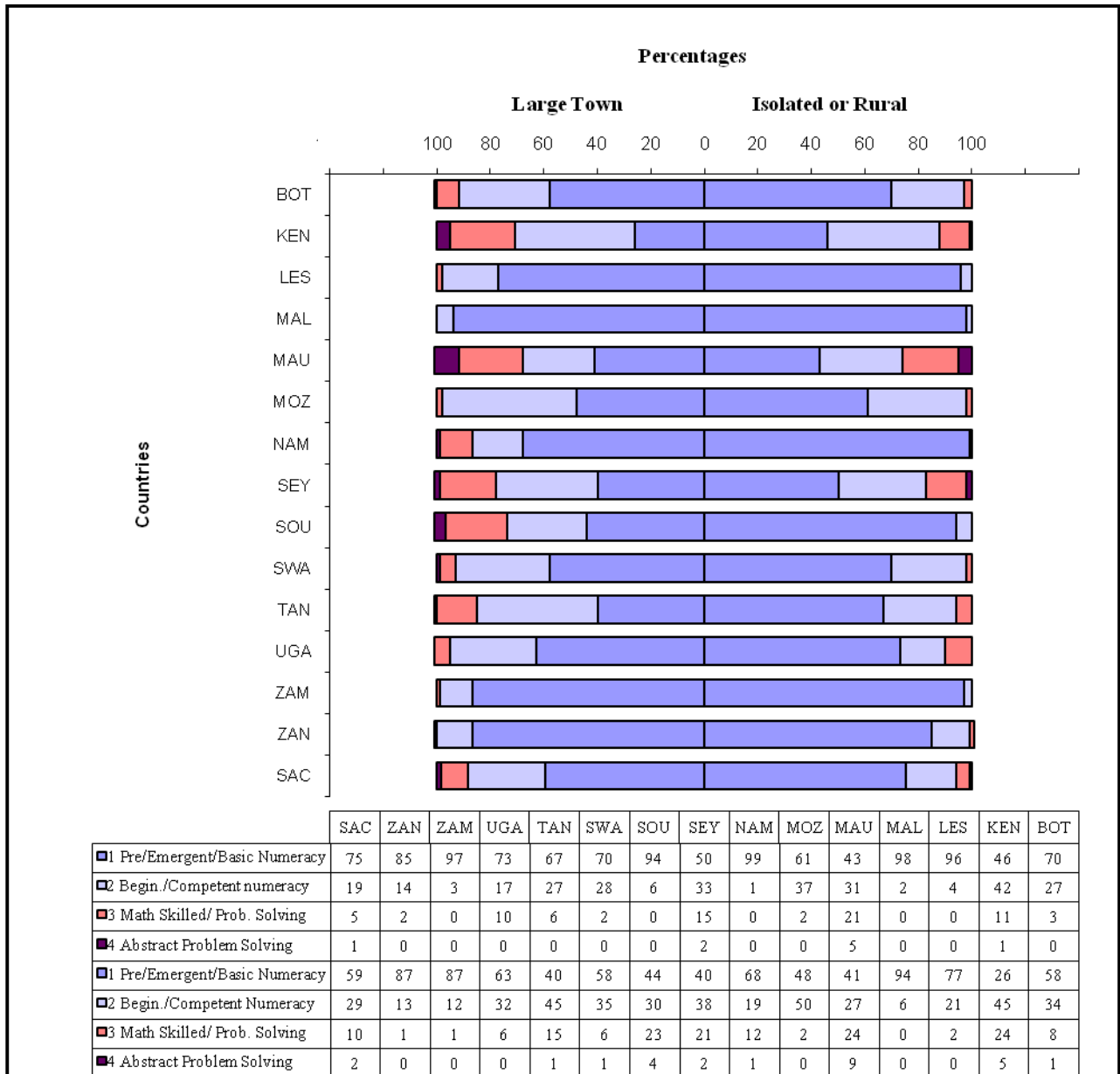
Source: Data from SACMEQ database, 2004

Figure 8.30 Mean scores of mathematics pupils in SACMEQ countries by school location

From the analysis in Figure 8.30 above, it can be observed that pupils from isolated/rural areas had a 487.4 mean in mathematics, their peers from small towns had a mean of 507.7, and those from large towns had a mean of 526.7. On average, pupils from isolated/rural and small towns in the SACMEQ countries had much lower mean performances in mathematics than pupils from large towns. This pattern was apparent in all countries apart from Zanzibar, where pupils from small towns performed better in mathematics than pupils from large towns.

In the isolated/rural areas, the variation in average performance for mathematics among countries ranges from 418.3 in Zambia to 577.6 in Mauritius, in small towns the variation ranges from 434.0 in Malawi to 584.2 in Mauritius, while for pupils from large towns the variation ranges from 451.2 in Malawi to 593.5 in Mauritius.

Figure 8.31 shows the percentage of mathematics results by SACMEQ countries and school location (see Appendix 53).



Source: Data from SACMEQ database, 2004

*Figure 8.31* Percentage of pupils' mathematics categories in SACMEQ countries by school location

Figure 8.31 above presents the different categories of competence in mathematics according to school location. In all SACMEQ countries, pupils living in large towns achieved higher categories of performance than pupils living in isolated or rural areas. In terms of means reached by pupils in the two areas, it can be observed in the figure above, that on average 59.3% of pupils from large towns and 74.8% from isolated or rural areas respectively performed at Category 1 level, and 28.3% and 19.3% of pupils from large towns and from isolated or rural areas respectively reached Category 2, while 10% and 5.1% of pupils from large towns and from isolated or rural areas

respectively reached Category 3. Finally, 1.6% of pupils from large towns and 0.6% from isolated or rural areas reached Category 4.

Among pupils from large towns, Mauritius was the country where 9.1% of the pupils reached Category 4. No pupils from Lesotho, Malawi, Mozambique, Uganda and Zanzibar reached the same level. Mauritius had the highest percentage (5%) of pupils from isolated or rural areas reaching Category 4, followed by Seychelles (2.4%) and Kenya (0.8%). The rest of the countries' pupils had less than 1% reaching this category.

For pupils from large towns that reached Category 1, the variation ranged from 94% in Malawi to 26.3% in Kenya, and among pupils from isolated or rural areas, the variation ranged from 99.1% in Namibia to 43.2% in Mauritius. Among pupils from large towns that reached Category 2, the variation ranged from 50.1% in Mozambique to 6% in Malawi, while for pupils from isolated or rural areas in the same category the variation ranged from 42.1% in Kenya to 0.8% in Namibia. In Category 3, the variation ranged from 23.6% in Mauritius to 0% in Malawi for pupils from large towns, and for pupils from isolated or rural areas, the variation ranged from 20.5% in Mauritius to 0% in Lesotho, Malawi, Namibia and Zambia.

Comparing the results reached by pupils in the three sub groups, namely gender, SES and school location, it can be seen that only a minute difference is recorded in terms of gender, but in some countries the differences in terms of SES and school location are far more substantial, as for instance in the cases of South Africa and Namibia. Apart from factors related to their developing country status, the results of the differences observed in these two countries may be related to the consequences of their Apartheid histories.

The results of the SACMEQ study confirm what is stressed by Kulpoo (1998), that in many less developed countries education in rural areas is often synonymous with a poor context for learning. In the latter half of the 1990s, primary school students in rural areas of sub-Saharan Africa consistently underperformed their urban counterparts by substantial margins. These disparities related to the school location are referred to by Foster (1977, as cited in Zhang, 2006) as one of the factors that contribute towards weak pupil performance. Educational inequality arises more from regional disparity than it does from individuals' characteristics, such as social class and social ethnicity. According to Heyneman and Loxley (1983, as cited in Zhang, 2006), schools tend to play greater roles in determining pupils' learning achievement in poor countries than in wealthy countries. The explanation given is that schools in poor countries vary more widely than those in wealthier countries in terms of their quality, in their use of trained teachers, and in materials. In

poor countries, therefore, the school a child attends makes a greater difference in how much pupils learn than it would in a more wealthy country.

Heyneman and Loxley's conclusions (1983, as cited in Zhang, 2006) confirm the findings in this chapter and Zhang's (2006) analysis of the SACMEQ II data. Taking into consideration the differences in school conditions, the study relates the regional disparities to the fact that pupils living in isolated or rural areas usually have low SES (Zhang, 2006):

*Children from rural areas of less developed countries often suffer a socio-economic disadvantage. This certainly seems to be the case for countries participating in the SACMEQ study. On average students attending rural schools came from families with lower levels of SES in every system. Families of sixth graders in Mauritius and Seychelles were, on average, much better off than those in other countries, especially Malawi, Mozambique, Uganda, and both the Tanzanian mainland and Zanzibar. While students' families in Mauritius and Seychelles were better off, the gaps between the well-off and not so well-off were much smaller in these countries than the case in Botswana, Namibia, and South Africa, as can be seen by the standard deviation in each country (Zhang, 2006, p.584).*

The same author stresses the relations in the SACMEQ study between rural students and SES:

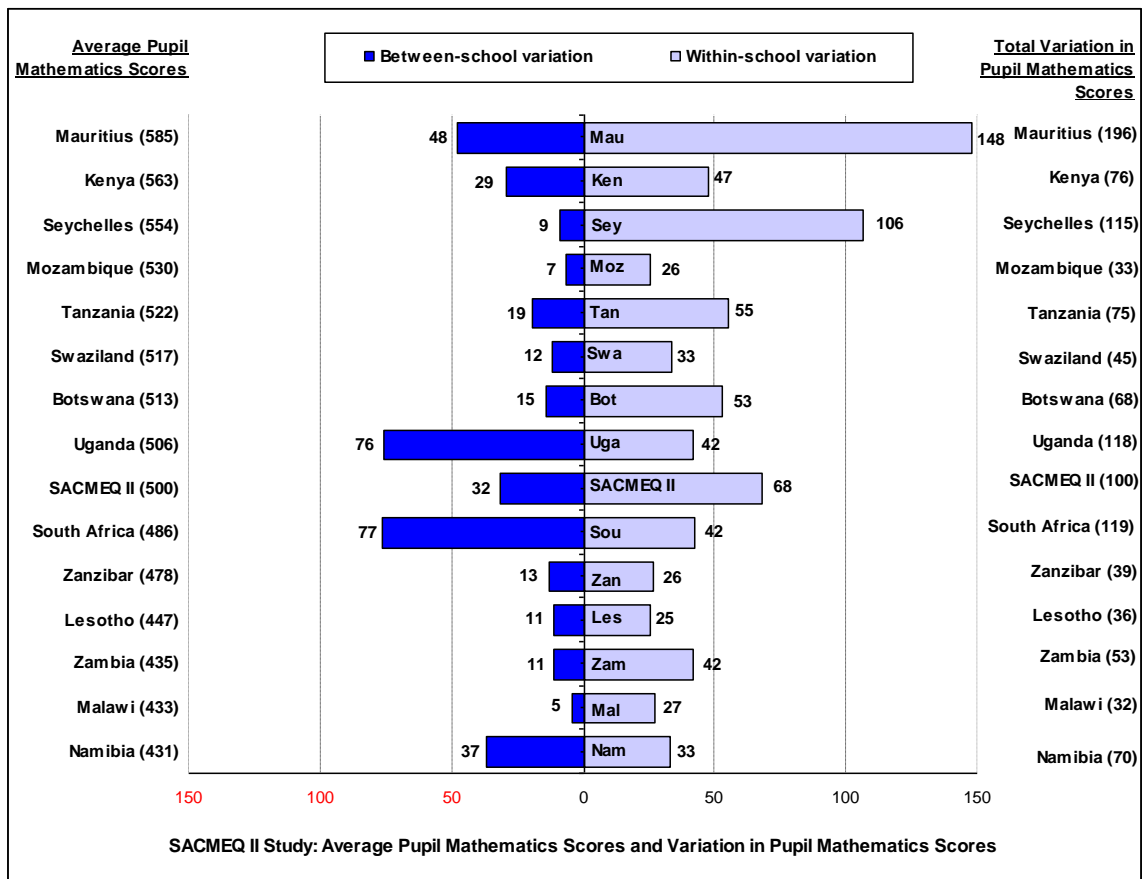
*Rural students not only lagged behind their counterparts in reading ability but also compared unfavorably in the school conditions that are important to academic success in general. The SES levels of the families of rural students were lower, and the rural students tended to have less home support for their academic work. In addition, rural students tended to be older than their urban counterparts, as a result of late entry into the school system, a higher incidence of grade repetition, or a combination of both. Even though many schools in the SACMEQ countries might benefit from a boost in physical and human resources, this was especially true in rural areas, where more school buildings needed major repairs, where teachers had fewer instructional resources, where schools had fewer facilities, and where teachers had lower reading scores (Zhang, 2006, p.96).*

Despite significant efforts from the various Ministries of Education who took into consideration the SACMEQ II results, it seems that in some countries many children do not have access to proper school facilities. This issue needs to be addressed and a concerted effort made to implement integrated programmes designed to improve teachers' and pupils' performance.



### 8.2.4 Variation in Mathematics Performance in the SACMEQ Countries between Schools and within Schools

Figure 8.32 presents the between-school and within-school variation in mathematics performance in SACMEQ countries.



Source: Dolata, 2003

Figure 8.32 The average of pupils' mathematics scores and variation in pupils' mathematics scores in SACMEQ countries

In SACMEQ countries as a whole, the total variation was 100 (68 within school and 32 between schools). In mathematics, the total variation ranges from 32 in Malawi to 196 in Mauritius. South Africa (119), Seychelles (115) and Mauritius (196) are the countries that present a total variation higher than the SACMEQ variation (100). In the variation within schools, it can be observed that Mauritius (148) is the country that presents the largest variation, followed by Seychelles (106), while Lesotho (25) shows the least variation. Malawi (27), Mozambique (26) and Zanzibar (26) are the countries that present the smallest variation within schools.

Figure 8.32 also shows the variation between schools, and it can be observed that South Africa (77) is the country that had the largest variation between schools, followed by Uganda (76) and Mauritius (48), while Malawi (5) had the smallest variation, followed by Mozambique (7) and Seychelles (9). South Africa (77), Uganda (76), Mauritius (48) Namibia (37) were the school systems in which the variation between schools was higher than in SACMEQ as a whole, where the variation within schools was 63. Between schools, the variation was 37. This is a pertinent issue to consider as in many countries there are discrepancies between ‘good’ schools and ‘no-so-good schools’ and an example of this is seen in South Africa. However, there are also variations seen within schools and this needs to be taken into account as it influences the teaching and learning within that school.

### 8.3 SUMMARY

The aim of this chapter was to report on the teacher and pupil performance in the SACMEQ reading and mathematics tests in Grade 6 in upper primary schools in Mozambique and other SACMEQ countries. The performance results were analysed by examining at provincial, national and regional levels as linked to gender, socio-economic status and school location. This information represents the basis for subsequent analysis in Chapter 9.

Teachers and pupils in all SACMEQ countries with the exception of South Africa and Mauritius submitted to the testing of their reading and mathematics test knowledge in order that the cognitive outcomes in the SACMEQ study could be measured.

On average, mathematics teachers in Mozambique achieved a mean of 782.8 points and reading teachers achieved 716.2, with a difference of about 66.6 points, whereas in all SACMEQ countries as a whole, mathematics teachers achieved 792 points and reading teachers achieved 734, with a difference of about 58 score points.

Mozambican pupils on average also performed better in mathematics (530) than in reading (516.7) in terms of their mean scores, with a difference of about 13.3 points.

When comparing the results it can be observed that, on average, teachers in Mozambique performed higher in both subjects, namely reading (716.2) and mathematics (782.8), than their pupils, who scored 516.7 in reading and 530 in mathematics, with a difference of about 199 score points in reading and 253 in mathematics. In the SACMEQ countries on as a whole, teachers

performed higher in both subjects, scoring 733.8 in reading and 791.7 mathematics, than their pupils by a difference of about 234 score points in reading and 292 in mathematics.

In terms of the levels of competency reached by teachers and pupils, the findings show that in Mozambique the lowest percentages of pupils and teachers' performance can be observed at Levels 1, 2, 7 and 8 and the highest percentages at Levels 4 and 5. The percentages begin to increase at Level 3 and decline at Level 6 in reading. In mathematics, the percentages begin to increase at Level 2 and decline at Level 5. In the case of teachers, the finding shows that the lowest percentages can be observed at Levels 1, 2, 3, 4 and 5 and the highest percentages at Levels 7 (problem solving) and 8 (abstract problem solving).

In the case of teachers, the percentage begins to increase at Level 5, and in case of mathematics, it decreases at Level 8. It is important to note that the situation in Inhambane province is quite worrying, with 20% of teachers achieving Levels 4 and 5 in reading and 2.7% of mathematics teachers reaching only Level 3, which is very low for teachers.

In the SACMEQ countries as a whole, the percentage begins to increase at Level 2 and decline at Level 6 (inferential reading) in the case of pupils. For reading teachers, the lowest percentage can be observed at Levels 1, 2, 3, 4 and 5 and the highest at Levels 7 and 8.

In SACMEQ countries as a whole, pupils' percentages in mathematics begin to increase at Level 2 and decline at Level 5. The majority of pupils reached Level 3 and 4. For teachers the lower percentage is observed at Levels 1, 2, 3, 4 and 5 and the highest at Levels 7 and 8.

Some 22% of the pupils in SACMEQ countries performed at Levels 1 (pre-reading) and 2 (emergent reading). This result means that those pupils cannot read at all, and could be considered illiterate. Special attention from key stakeholders, including the respective Ministries of Education, is necessary in countries like Zambia (47.7% in reading and 71.2% in mathematics), Malawi (45.5% in reading and 74.3% in mathematics), Namibia (43.4% in reading and 76.6% in mathematics), South Africa (31% in reading and 52.2% in mathematics) and Lesotho (24.4% in reading and 65.9% in mathematics), where pupils performed at Levels 1 and 2 in reading and mathematics, which is extremely low for Grade 6. The higher percentage of pupils in the two levels has far-reaching implications in terms of the internal and external efficiency of these education systems. The quality is low, and pupils who perform at this level cannot proceed to higher levels of schooling. In Mozambique, pupils are meant to learn to read and write in Grades 1 and 2.

Mozambican boys (537 and 518.4) performed better than the girls (519.5 and 514.1) in both subjects. In the SACMEQ countries as a whole, girls performed better in reading (505.1) than boys (494.6), while in mathematics boys (501.7) performed better than girls (498.1).

As the results show, in Mozambique as in the SACMEQ countries as a whole, pupils from higher SES and large towns performed better in reading and mathematics than pupils from lower SES and isolated/rural areas. Using SACMEQ data, Zhang's (2006) analysis found that rural pupils in some SACMEQ countries not only lagged behind their counterparts in reading ability, but also that the conditions of rural schools compared unfavourably with the condition of urban schools. School conditions are important to academic success in general. Pupils from rural areas belong to lower SES families and they tended to have less home support for their academic work. In addition, rural students tended to be older than their urban counterparts, as a result of their late entry into the school system, a higher incidence of grade repetition, or a combination of both. In addition to their poor condition, schools in rural areas had fewer instructional resources and fewer facilities. Teachers at these schools recorded lower reading scores.

Judging from the results of the SACMEQ study, it seems that many children in some countries do not have access to proper school facilities, despite significant efforts from the Ministries of Education in those countries, which may show that there is a relationship between the condition of rural schools and weak teacher and pupil performance. Integrated programmes should be established, aimed at the simultaneous improvement of the condition of schools, and teacher and pupil performance.

It can be observed from the variation within and between schools that besides the school location, school resources and grade repetition (78.2%), Mozambique was one of the school systems that presented more equity, meaning that there was no high level of disparity in terms of the school system and pupil performance in school and between schools. To be specific, the total variation in Mozambique was 42, (12 between school and 29 within school), a fair reflection on the role that the Ministry plays in seeking equity for all its pupils. A similar pattern can be seen in Malawi (7 and 18), Zanzibar (12 and 37), Lesotho (13 and 21) and Swaziland (17 and 29).

In contrast, countries such as Mauritius and Seychelles present the highest variation within school of 110 and 142 respectively, while South Africa was the country that showed the highest variation between schools, of 104. Reasons for the difference in those three countries in terms of pupil performance within school (Mauritius and Seychelles) and between schools (South Africa) should be identified and ultimately addressed.

In the era of education for all one of the challenges for all education systems is to improve the quality of the education system and provide equitable education across the board. According to Sedel (2003, p.43) “the challenge of basic education policy is not only a challenge of quality but also one of equality: of equal opportunities to learn and achieve.” As stated by Dolata, Ikeda and Murimba (2004), the above results have implications for education in SACMEQ countries in terms of access: “Seychelles, Uganda, and Malawi have excellent participation rates for the first six years of schooling – with Net Enrolment Ratios that approach or exceed 95 percent. But Mozambique is much lower – with a Net Enrolment Ratio in the region of 70 percent” (2004, p.8). Quality and equity while are good in Malawi, but South Africa and Uganda need to improve equity by reducing the between-school variation in pupil reading and mathematics scores.

Chapter 9 highlights the main factors, which explain the pupil performance variation in Mozambique and other SACMEQ countries, and their relationship to teacher competence. The Multivariate Regression Model (MRM) is used to analyse to what extent the pupil performance variation is explained by various domains described in the conceptual framework.