

# **Variance in Pupil Reading and Mathematics Performance:**

**Why is it so large in Mauritius?**

**Dhurumbeer Kulpoo**

**Maya Soonarane**

A paper presented for the SACMEQ International conference  
Paris  
28-30 September 2005

## *Abstract*

*Achieving Education for All by the year 2015 is a major challenge for many countries. However successful development-oriented policies should be a combination of three key ingredients-increased participation, improvement of quality and promotion of equity. Mauritius has an excellent record of pupil participation, is faring relatively well in terms of quality but shows a serious problem of educational equity. In this paper the issue of equity has been examined by analyzing the variance in pupil achievement in reading and mathematics using data from the SACMEQ data archive .Large within-school variance could be attributed mostly to a specific form of streaming occurring in nearly all schools related to pupils repeating the grade. The implication of this finding is that the Ministry needs to look at the allocation of pupils to classes, the training of teachers in the area of mixed-ability teaching and continuous assessments – and remedial education.*

## **Introduction**

One of the goals of the Dakar Framework for Action is to achieve Education for All by 2015. However the drive to achieve this goal should not focus only on broadening access at the expense of educational quality. The new EFA vision require nations to develop education plans that combine the goal of expanding access, improving quality and promoting equity. The challenges of increased participation and improving quality and equity need to be addressed simultaneously by ministries of education for the success of development-oriented policies. Several countries have conducted studies to assess the performance of their education systems. Fourteen countries including Mauritius participated in the research studies conducted by SACMEQ in 1995 and 2000/2001. The aims of the research were to monitor and evaluate the general conditions of schooling and the quality of basic education and generate information that can be used by decision-makers to plan improvements in their education systems.

A measure of access can be obtained from participation rates or more specifically from a country's Net Enrolment Ratio. Since nearly all education systems focus on learning outcomes, this is frequently used as a key indicator of educational quality. The SACMEQ study used several approaches to measure learning outcomes or more specifically, educational achievement in reading and mathematics. One measure of achievement was in terms of test scores. The test scores were further transformed to a mean of 500 with a standard deviation of 100 for all the SACMEQ countries. This enabled a comparison to be made between countries and more important, it was possible to compare test scores between SACMEQ I conducted in 1995 and SACMEQ II conducted in 2001. School systems with high average scores were considered to be delivering relatively high levels of educational quality.

A second and more accurate assessment of learning achievement was the establishment of benchmarks for pupils attaining minimum and desirable levels of achievement. The two benchmarks helped to identify three groups of pupils: namely pre-functional, functional and independent learners.

A third measure of pupil achievement was the proportion of pupils falling into clear, describable skill levels that were hierarchically ordered. The SACMEQ II Project moved away from traditional approaches based on the calculation of test scores (the number of correct responses to test items) towards the use of Modern Item Response Theory to generate descriptions of 'levels of increasing pupil competence'. Eight skill levels were developed for Reading and Mathematics. The skill levels for Reading are pre-reading, emergent reading, basic reading, reading for meaning, interpretive reading, inferential reading, analytical reading and critical reading. For mathematics the skill levels are prenumeracy, emergent numeracy, basic numeracy, beginning numeracy, competent numeracy, mathematically skilled, problem solving and abstract problem solving. Details of the skill levels can be found in *appendix I*. This approach to describing pupil reading and mathematics achievement offered a mechanism for describing the performance of pupils in a manner that was more meaningful within a teaching-learning context.

The ideal goal of education systems is to provide high quality education to all learners. In particular, it is the responsibility of governments to ensure that all pupils have equal chances not only of access to basic education, but also of achieving high levels of performance. In other words it should not matter to which school a pupil goes, but in reality for a variety of reasons, systems tend to offer different learning opportunities to different pupils in different schools within the same system, or in different classes within the same school. Measures of equity could be obtained from variation in the allocation of resources to all schools and variation in pupil achievement.

School systems with low variation in achievement can be considered to be ensuring that all pupils have the same levels. These levels may be high or low but are more or less the same.. A large variation in achievement indicates great inequity among schools and pupils. The overall variance into two components – between school variance and within school variance. A large between-school variance means that there are large differences among schools which imply high inequity among the different education zones. Large within-school variance means that there are large differences among pupils within a given school. This usually arises from differential treatment given to pupils within schools. Both measures of equity are highly relevant and can inform decision makers on the extent to which quality education for all has been achieved.

How did Mauritius fare on the three dimensions of access, quality and equity? Mauritius had achieved excellent participation rates for the first six years of schooling, with a Net Enrolment Ratio which had remained fairly constant at 98 percent since 1995. This can be explained by the high social demand for education and the great strides made by Government for the provision of universal primary education.

In terms of educational quality, compared to the SACMEQ average of 500, Mauritius had a mean pupil reading score of 550 in reading in 1995 and in 2001 this score had declined slightly to 536. The mathematics score in 2001 was 585. On a simple rank-order list of country scores for SACMEQ II, Mauritius was highest among the SACMEQ countries in mathematics and ranked fourth in reading. Being among the top group of the SACMEQ countries, it can be deduced that Mauritius was faring well in terms of quality.

When pupil achievement was examined in terms of the skills that pupils had attained at the end of six years of primary schooling, in 2001, it was found that , 18.7 percent and 20.6 percent of pupils were still at the first two levels of reading and mathematics respectively. This meant that about one-

fifth of grade 6 pupils had not mastered basic reading skills and basic numeracy. Such pupils would experience difficulty in demonstrating the basic skills that would enable them to be effective members of the Mauritian society.

Results of the SACMEQ study showed that in general the Ministry had been successful in establishing and maintaining equitable distribution of both human and material resources among the different education zones with slightly high variation among schools within a zone. Large variation was however observed in pupil achievement. The overall variation in pupil scores for Mauritius was large compared with the other SACMEQ countries. In reading, Mauritius had the fourth highest average score, but the second largest overall variance which is an indication of major inequities in the system.

Thus while Mauritius seemed to be doing well in terms of access and educational quality, the system had a serious problem of educational equity. Ross and Zuze (2004) argued that league tables that rank countries according to their average achievement scores are only one dimension as such a judgement bypasses important issues related to equity. The authors used a broader alternative view to define school system performance. This included three benchmarks for high performance school systems:

*High quality* indicated by high values of expected average pupil reading achievement in a situation where the socio-economic backgrounds of pupil intakes are equal to the average across all school systems;

*High social equity* indicated by low values of the impact of pupil socio-economic background and achievement; and

*High distributional equity* indicated by low values of spread in pupil achievement.

Mauritius, which was the fourth best school system from a traditional view of performance based on a simple ranking of reading average score, did not meet any of the three benchmarks of high quality, high social equity and high distributional equity when analysed from this alternative perspective.

### **Objectives of the study**

In this paper the authors have set the following objectives:

1. to examine the between-school and within-school variance in reading and mathematics achievement across all five zones in Mauritius
2. to compare values of variance in achievement with those of the SACMEQ I study
3. to investigate the relationship between variance in achievement with pupil, teacher and school characteristics in an attempt to explain the large variation in achievement of standard 6 pupils
4. to make appropriate policy suggestions to address the issue of educational equity.

### **Background**

The Republic of Mauritius is an archipelago with Mauritius as the main island and other smaller islands (Rodrigues, Agalega and St Brandon) dispersed over a wide area of the South West Indian Ocean. Mauritius has a multiracial population estimated at 1.3 million at the end of 1988. The land

area is 1969 square kilometers, which gives the country a high population density, with a high concentration of people in the belt of towns in the two urban districts Port Louis and Plaine Wilhems. Some country basic data is shown in Table 1.

Mauritius has a 6+5+2 education structure; that is, six years of primary schooling leading to the Certificate of Primary Education, followed by five years of secondary education leading to the Cambridge School Certificate and a further two years of higher secondary ending with the Cambridge Higher School Certificate. This structure is depicted in Figure 1 below and the complete education and training provision is shown in Table 2.

Age	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Compulsory Education																			
Pre-Primary																			
Primary																			
Secondary																			

Figure 1: The Education Structure

The education policy is based on a three-pronged philosophy centered around access, relevance and achievement to achieve the overall objective of guaranteeing universal free and compulsory education up to the age of 16 by 2005 and improving transition to tertiary education.

### Primary Education

Primary education is universal with a gender parity index of 1.0. All primary schools are coeducational. Primary schools are scattered all over the island and although there is a higher concentration in urban areas than in rural areas there is, on average, one primary school in every



village thus ensuring easy access for all children to a primary school. The principle of 'catchment area' is used in order to manage the high demand for admission to certain schools. Of the 293 primary schools, 225 are run by government. Religious Authorities receive grants from the government to defray teachers' salaries and operating costs for the running of 53 schools. The remaining 15 schools are private and fee-paying

The primary school day lasts six hours and the school year has 185 days divided into 3 terms. All schools are equipped with basic facilities such as the provision of water, toilets, electricity, and telephone facilities. To improve communication with schools, fax facilities have also been made available to all government and aided schools since 2002. The policy of the Ministry is to provide all classrooms with blackboards and an adequate number of pupils' chairs, tables to ensure that each pupil has a sitting and writing place. In primary schools a class teacher is responsible for the teaching of all subjects except the Ancestral languages which are taught by specialist teachers. In 2001 about 5000 teachers taught in the primary schools and the overall pupil-teacher ratio was 34:1, with class sizes ranging from about 15 to about 50. All teachers follow a compulsory training course before commencing their career. In-service courses are also organized for teachers.

Examinations at the end of each level regulate the flow of students to the next level. Pupils sit for national and international examinations at the end of each cycle. At the primary level promotion from one grade to the next is automatic until Grade 6 when pupils sit for the Certificate of Primary Education (CPE). This examination has a dual purpose: that of certification and selection for entry to a secondary school. Pupils who are unsuccessful at the CPE examinations and under 12 years of age may stay on at primary school for a further year in order to take the examination a second time. Those who are not successful after a second attempt are provided with an alternative type of education under the Pre-vocational Education Scheme.

The internal efficiency of the primary sector is high with a high completion rate of 98 percent. The pass rate at the end of the primary cycle is about 65 percent. A high internal efficiency is in fact due to automatic promotion at all grades. The absence of continuous assessment and remedial education

has resulted in about 35 percent of primary school children leaving school without having acquired the minimum skills to cope with learning at the next grade. A high repetition rate of about 20 percent is observed among Standard 6 pupils. There is a wide gap between high and low performing schools. The ranking system of the CPE examination which prevailed till 2002, selected pupils for admission to secondary schools and this exerted tremendous pressure on both students and their parents. Recourse to the ranking system was made because of limited number of seats in secondary schools which were perceived as ‘good’ schools by parents. About 25 percent of pupils who had passed the CPE and did not secure a seat in those ‘good’ secondary schools repeated Grade 6 to improve their results. With expanded access to secondary schools repetition among CPE graduates who wished to improve their results decreased significantly. In 2002 the CPE ranking was replaced by a new assessment mechanism based on a grading system and the regionalisation of admission to junior secondary level. CPE repeaters are now mostly those who have failed the examination at their first sitting.

Table 1: Country basic data

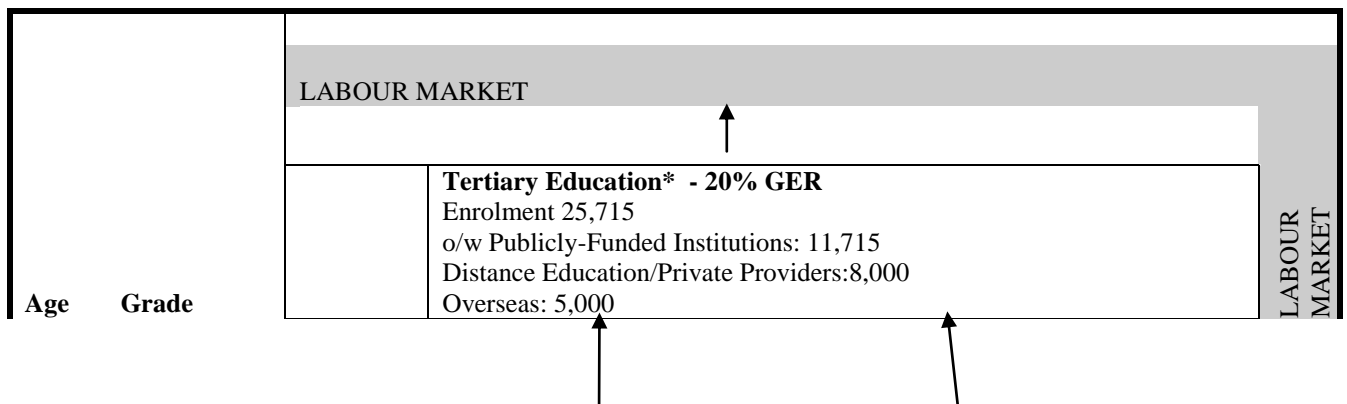
<b>The Country and People</b>		<b>2001</b>	<b>2002</b>	<b>2003</b>
Land Size (sq km)	2040			
Population, Total (million, estimated)		1.200	1.210	1.220
Population Growth (annual %)		1.0%	0.9%	1.0%
<b>Economic and Development Indicators</b>				
Life expectancy (years)		71.9	72.0	72.1
Fertility rate (births per woman)		1.9	1.9	1.9

Prevalence of HIV (Female, % age 15 -24)		10.7	13.5	11.3
People Living with HIV/AIDS (est)		206	289	496
HIV/AIDS deaths (est)		6	15	18
Orphans as a % of all children (est up to 19 years)		0.16	0.15	NA
Literacy rate (% age 15 and above)	84.3% (2000)			
GDP (current b\$)		4.5	4.7	5.5
GDP Growth (annual %)		5.2	1.9	4.5
<b>Education</b>				
Number of Schools (Primary)		293	290	291
Number of pupils (Primary)		134085	132432	129616
Number of teachers (Primary)		5379	5256	5620
Gross Enrolment Ratio (pre-primary 4-5 years)		96%	95%	99%
Gross Enrolment Ratio (primary 6-11 years)		103%	103%	102%
Gross Enrolment Ratio (secondary 12-18 years)		76%	78%	81%
Net Enrolment Ratio (primary 6-11 years)		91%	89%	89%
Net Enrolment Ratio (secondary 12-18 years)		67%	68%	71%
Percentage repeaters (primary)		4.4%	4.9%	4.5%
Duration of compulsory education (in years)	11 years (2005)			
Pupil to teacher Ratio				
	Pre-primary	16	15	15
	Primary	25	25	23
	Secondary	18	18	17
Percentage trained teachers (pre-primary)				100%
Percentage trained teachers (primary)		100%	100%	100%
Percentage trained teachers (secondary)		16%		

*References*

Ministry of Education & Scientific Research  
Central Statistics Office, Mauritius

Table 2: Mauritius Education and Training Provision System.2004



+	<b>Upper Secondary</b>		
18	Form VI Upper	<i>Cambridge Higher School Certificate (HSC)</i> Pass rate –76% (5,245/6,883)	NTC Level II &III - <b>IVTB</b> Others-LCC, City & Guilds, Pitman, etc....(Private Education/Training Institutions)
17	Form VI Lower	<b>VI Form Colleges</b> State Schools:16 Private Schools:48 Teachers*:5,553 Enrolment:14,713	<b>Vocational Training</b> IVTB Centres:12      Enrolment: 6,553 IVTB Teachers:186
<b>Lower Secondary</b>			
16	Form V	<i>Cambridge School Certificate (SC)</i> Pass rate – 75% (10,843/14,527)	<b>Prevoc-Vocational Education<sup>1</sup>(3 years)</b>
15	Form IV	<b>Secondary Education <sup>2</sup>: 71% GER</b>	
14	Form III		
13	Form II		
12	Form I		
<b>Primary</b>			
11	Std VI	CPE Failed or CPE Passed	by Choice
10		Certificate of Primary Education (CPE) Pass rate – 63% (17,217 / 27,332)	
9		<b>Primary Education – 103% GER</b>	
8			
7			
5+6			
<b>Pre-Primary</b>			
5		<b>Pre-primary Education – 96% GER</b>	
4		State Schools: 178      Teachers: 2,474	
3		Private Schools: 892      Enrolment: 37,483	
<p><b>Key</b> : NTC – National Trade Certificate, IVTB – Industrial &amp; Vocational Training Board</p> <p><b>Note</b> <sup>1</sup> : Pre-vocational Education was launched in 2000/01 school year and comprises predominantly students who failed CPE examinations: it is followed by the NTC Foundation Course</p> <p><sup>2</sup> Includes both Lower, Upper Secondary &amp; Pre-Vocational</p> <p><sup>3</sup>: Include both General Purpose and Oriental</p>			

Provisional Figures for Tertiary Education & IVTB

**Note 1** : Pre-vocational Education was launched in 2000/01 school year and comprises predominantly students who failed CPE

examinations: it is followed by the NTC Foundation Course

2:: Requirements for NTC Level II vary between SC and HSC or NTC III

3: Requirements for NTC Level III vary between Form III and SC or NTC III Foundation Course (Min.Age:15)

4: Refers to Post A-Level/HSC

\*: Includes both Upper & Lower Secondary

\*\* : Refers to enrolment in IVTB Centres only, o/w Full-time (NC=TC II & III):1,335 – Part-time (mostly No-Award Courses):

4,387 – Apprenticeship (students sharing work placement and IVTB Classes): 1,394

### **Conduct of the study**

The SACMEQ study is a large-scale educational policy research project. It has been designed to develop a detailed analysis of effective educational inputs, educational outcomes and the nature of the linkages between inputs and outcomes. Two studies (known as ‘SACMEQ I’ and ‘SACMEQ II’) were undertaken in 1995 and 2000 respectively. Seven countries participated in the SACMEQ I study and 15 countries in the second study. Grade 6 pupils were the target population of

the study. The reason for this is that it is the last grade of primary education in some countries and strategic in assessing pupil's readiness to successfully complete primary school. In 1995 pupils were tested in reading and in 2001 pupils were tested in both reading and mathematics.

### **Instrument development**

The SACMEQ II study included instrumentation that was suitable for collecting information to inform the Ministry, teachers, and parents about the reading literacy and mathematics achievement of Standard 6 pupils. This instrumentation also allowed comparisons to be made with the Standard 6 reading literacy achievement in 1995. There were several instruments that were developed:

A Pupil Reading Literacy test

A Pupil Mathematics test

A Pupil background questionnaire

A Teacher questionnaire

A School Head's questionnaire

### **Sampling**

All sample designs applied in SACMEQ II were selected to meet the standards set down by the International Association of Educational Achievement. These standards require sample estimates of important pupil population characteristics to be (a) adjusted by weighting procedures designed to remove the potential bias that may arise from different probabilities of selection, and (b) have sampling errors for the main criterion variables that are of the same magnitude or smaller than a simple random sample of 400 pupils (thereby providing 95 percent confidence limits for sample estimates of population percentages of plus or minus 5 percentage points, and 95 percent confidence limits for sample estimates of population means of plus or minus one tenth of a pupil standard deviation unit).

The desired target population in Mauritius was 'all pupils in Standard 6 in 2001 in the first week of the eighth month of the school year who were attending registered government or non-government

schools in the country'. The number of pupils in the desired, excluded, and defined population have been presented in Table 3. It will be seen that the strata are zones. A deliberate decision was taken to have estimates for all variables for each zone in the country. There has been a movement towards decentralisation not only in Mauritius but also in nearly all other countries in Southern Africa. Much of the responsibility for the running of schools resides in the Zonal Directorate. The Ministry still remains responsible for the overall system. Variations between and within zones on many variables were of interest to the Ministry and hence the decision to have estimates for each zone.

There were 3 'small' schools excluded from the desired population. These schools were excluded because they did not have more than 15 pupils in Standard 6. This resulted in 29 pupils being excluded out of 26,510 Standard 6 pupils. Within each selected school, a simple random sample of 20 pupils was selected from among all Standard 6 pupils.

Table 3: The numbers of schools and pupils in the Desired, Excluded, and Defined populations in Mauritius

Zone	Desired		Excluded		Defined	
	Schools	Pupils	Schools	Pupils	Schools	Pupils
Zone P Louis & North	82	8908	-	-	82	8908
Zone East & B Bassin	77	6121	2	21	75	6100
Zone South & Curepipe	62	5605	-	-	62	5605
Zone West & Vacoas	42	4819	-	-	42	4819
Zone Rodrigues	14	1057	1	8	13	1049
Mauritius	277	26510	3	29	274	26481

The response rates for the schools was 100 percent and the rate for pupils was 94.7 percent. The non-responding pupils were those who were absent on the days of testing. This absenteeism amounted to about 5.3 percent. An investigation of the SACMEQ data on absenteeism among Grade 6 pupils showed that absenteeism was mostly associated with illness and occasionally with family reasons. It was never associated with pupils having to work or having to pay school fees.

After drawing the sample of 20 pupils per school, sampling weights were used to adjust for the disproportionate allocation of the sample across the districts and also to account for the loss of student data due to absenteeism on the days of testing.

The sample of schools was drawn from a sampling frame containing all schools having a Standard 6 class and the Standard 6 enrolment for each of these schools. Using a program from the IIEP called SAMDEM, the sample of schools drawn had a probability proportional to size (the measure of size being the Standard 6 enrolment). An estimate of the intra-class correlation (or rho, a measure of the ratio of between school variance to within school variance on key outcome measures) that the country deemed that existed for Standard 6 was also used to fine-tune the sample. The final sample drawn (planned) and the achieved sample after data collection and data cleaning has been presented in Table 4.

Table 4: The planned and achieved samples of schools and pupils

Strata	Schools		Pupils	
	Planned	Achieved	Planned	Achieved
Zone Plouis & North	45	45	900	839
Zone East & BBassin	33	33	660	636
Zone South & Curepipe	32	32	640	585
Zone West & Vacoas	36	36	717	693
Zone Rodrigues	13	13	257	254
Mauritius	159	159	3174	3007

#### Calculation of sampling weights and sampling errors

When data are collected using multi-stage sample designs from sources at different levels of aggregation (pupil, teacher, school) a great deal of care needs to be taken in interpreting the stability of sample estimates of population characteristics. For this report, all data were undertaken at the between-pupils level. That is, all data collected from teachers and school heads were disaggregated across the pupils data file before analyses were undertaken.



The interaction of sample design and level of data analysis required that extra caution be used in interpreting estimates obtained by using information from teachers or school heads. The sampling errors of estimates derived from these two 'disaggregated' sources were larger than figures that were reported when using standard statistical software packages.

The calculation of these errors acknowledged that the sample was not a simple random sample - but rather a complex two-stage cluster sample that included weighting adjustments to compensate for variations in selection probabilities. The software errors were calculated using the IIEP/JACK software. For example consider a sample percentage of pupils who reached the minimum level of mastery on the reading test was 55.6 and the sampling error (SE) was 1.93 percent. These figures indicate that one could be 95 percent confident that the population percentage of pupils who reached the minimum level of mastery was within the following limits:  $55.6 \pm 2(1.93)$  percent. That is, between a high limit of 59.46 percent and a low limit of 51.74

#### Data collection

The number of schools to be tested was 159 and it was estimated that it would take two days to collect all of the data in one school. This amount of data collection was the equivalent of 80 test administrator days. The time allowed for the total data collection was two weeks. The data collectors used for the data collection were the primary school inspectors. The pupil names in Standard 6 had been collected by means of a Pupil Name Form from each of the schools selected in the sample. The sub-sample of 20 pupils per school was drawn using random number tables. Pupil booklets were prepared for each of the sampled pupils with the relevant ID information being written into the front page of the booklet. The booklet consisted of a Pupil Questionnaire followed by a Reading test and then a Mathematics test. In a similar fashion the names of the reading and mathematics teachers of Standard 6 pupils were known from the School Form and a sub-sample of three Mathematics teachers and three Reading teachers was drawn for each school. Again Teacher

booklets were prepared for each of the sampled teachers. A Data Collection Manual was prepared including information on every step to be taken by the data collectors.

On the first day, the pupil questionnaire, the teacher questionnaire, the pupil reading tests, and the School Head questionnaire were completed. On the second day the pupil Mathematics tests were completed. The Mathematics test was not administered to teachers in Mauritius.

ata from the SACMEQ data archive to analyse variance in achievement. The standard deviation of achievement scores is used to measure the spread in pupil achievement between schools and the coefficient of intra-class correlation is used as a measure of variance in pupil achievement that are attributed to differences within schools.

## **Results**

### **Variance in Reading and Mathematics in Mauritius**

#### **(i) Overall variance**

Some of the results of the SACMEQ II policy research study have been summarized in figure 2. The left hand column of figures shows the average pupil reading scores for each SACMEQ school system. The average score for all SACMEQ countries was 500. The averages for school systems ranged from a low value of 429 for Malawi to a high value of 582 for Seychelles. The right hand column of figures shows the total variation in pupil reading scores for each SACMEQ school

system. The total variation for SACMEQ overall was 100. The total variation ranged from a low value of 25 for Malawi to a high value of 154 for Seychelles.

The graph shows the “between-School” and “within-School” components of variation for all SACMEQ countries. The SACMEQ overall Between-School variation was 37 whereas the within-school variation was 63. The between-school variation was highest for Uganda but the within-school variation was largest for Seychelles.

Seychelles(582)	Seychelles(154)	Kenya (546)
Kenya (79)		
Tanzania (546)	Tanzania (81)	
Mauritius (536)	Mauritius(148)	
Swaziland (530)	Swaziland(47)	
Botswana (521)	Botswana(78)	
Mozambique(517)	Mozambique(42)	SACMEQ II (500)

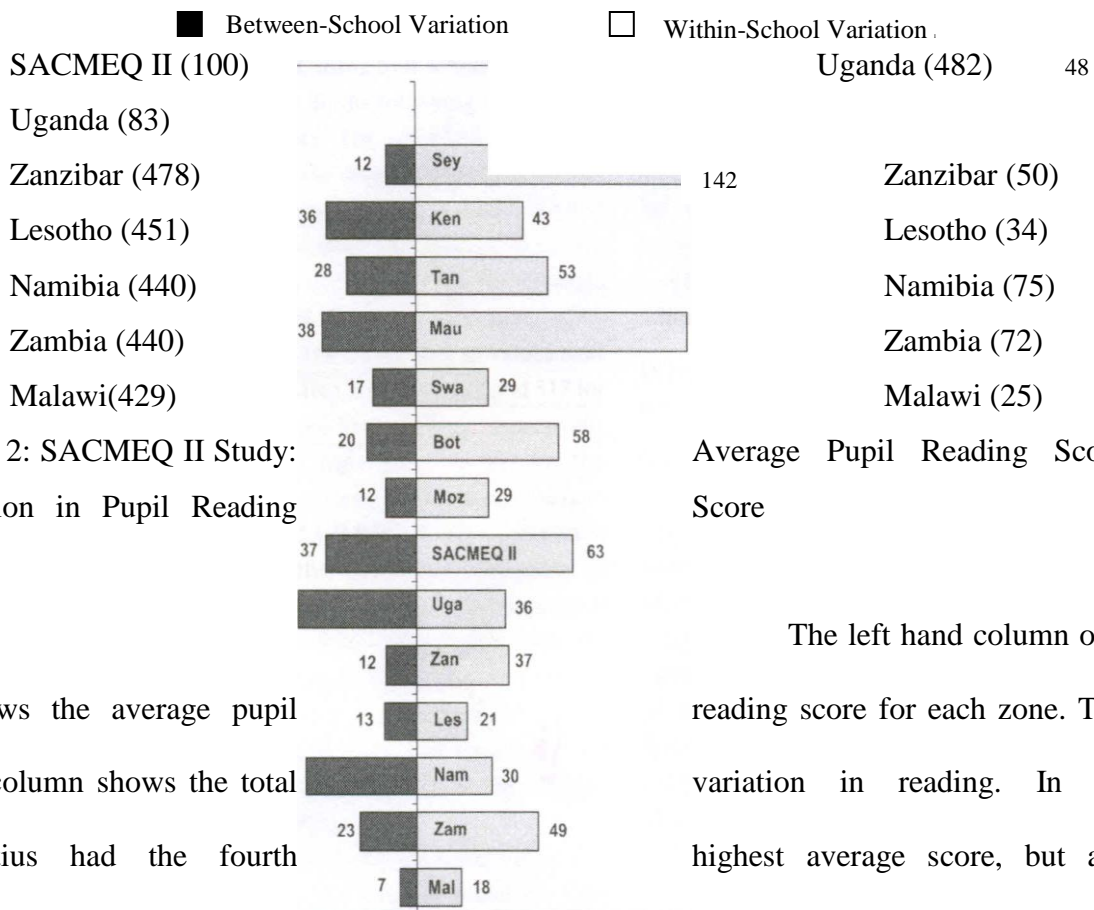


Figure 2: SACMEQ II Study: Variation in Pupil Reading

Average Pupil Reading Score and Score

3 shows the average pupil hand column shows the total Mauritius had the fourth

The left hand column of Figure reading score for each zone. The right variation in reading. In reading, highest average score, but also the

second largest or standard deviation of 148. In Mathematics, Mauritius had the highest average score, but also the largest variance of 196 which was nearly twice the SACMEQ variance.

The between- school variation for reading was similar to the corresponding SACMEQ value, but for mathematics, it was 48, being 1.5 times higher than the corresponding SACMEQ value. The within-school variation of 110 was large (1.7 times more than for all SACMEQ countries together) for reading and very large (2.5 times more) for mathematics (148) when compared to the SACMEQ corresponding value of 68. This is an indication of major inequities both between and within schools in the country.

The total variation in reading scores across all five zones ranged from 119 for the island of Rodrigues to 170 for Zone West & Vacoas. In mathematics, a much larger variation was observed among the zones, which ranged from 110 to 244 for the same two zones. Zone West & Vacoas had the highest score and also the largest overall variance which was more than 1.5 times the overall SACMEQ value for reading and nearly 2.5 times greater for mathematics.

**(ii) Between-school variance**

The figures also show the overall variation broken down into ‘between-school’ and ‘within-school’ components. The SACMEQ between-school variation was 37 and 32 for reading and mathematics respectively. When the values of variance are examined across the five zones in Mauritius the between school variance ranged from 31 to 51 for reading and from 27 to 80 for mathematics (Figure 3 & 4). There was not much difference across the zones for between-school variance except for Zone West & Vacoas where this value was nearly 1.5 times the SACMEQ value for reading and 2.5 times greater for mathematics. This shows that there are large differences among the schools of Zone West & Vacoas implying an equity problem among the schools of this zone.

## **Within-school variance**

High within-school variance was observed across all zones for both reading and mathematics except for Rodrigues where the within-school variance was much lower. The within-school variance was highest for Zone West & Vacoas being nearly 1.5 times larger than the corresponding SACMEQ value for reading and 2.5 times greater for mathematics. Zone West & Vacoas had both large between-school and within-school variance for both reading and mathematics. This zone presented not only an equity problem among the schools but also unequal treatment to pupils within schools, usually arising from selection practices and the way teaching is organized and delivered. This may often imply ability streaming being practiced within schools.

## **Variance for SACMEQ I & II study**

For the reading test conducted in 1995 in the SACMEQ I study, Mauritius had an overall variance of 131 (Figure 5). The between and within-school variance were 33 and 98 respectively. It can be seen that the overall variance has increased from 131 to 148 during the six year period between the two studies. The between-school variation has stayed the same (33 compared to 38) while the within-school variance has increased from 98 to 110.

Zone West & Vacoas presented a similar picture in 1995 with the largest between and within – school variation as compared to the other zones of the country.

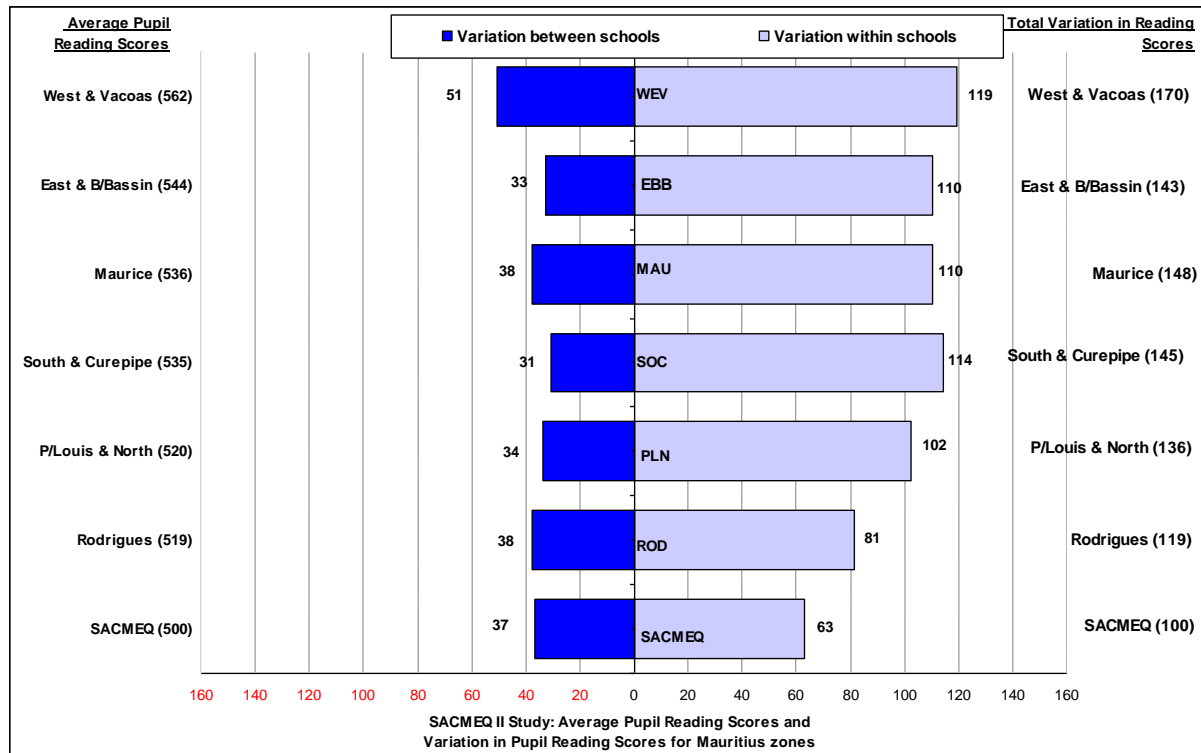


Figure 3: SACMEQ II Study: Average Pupil Reading Score and Variation in Pupil Reading Score

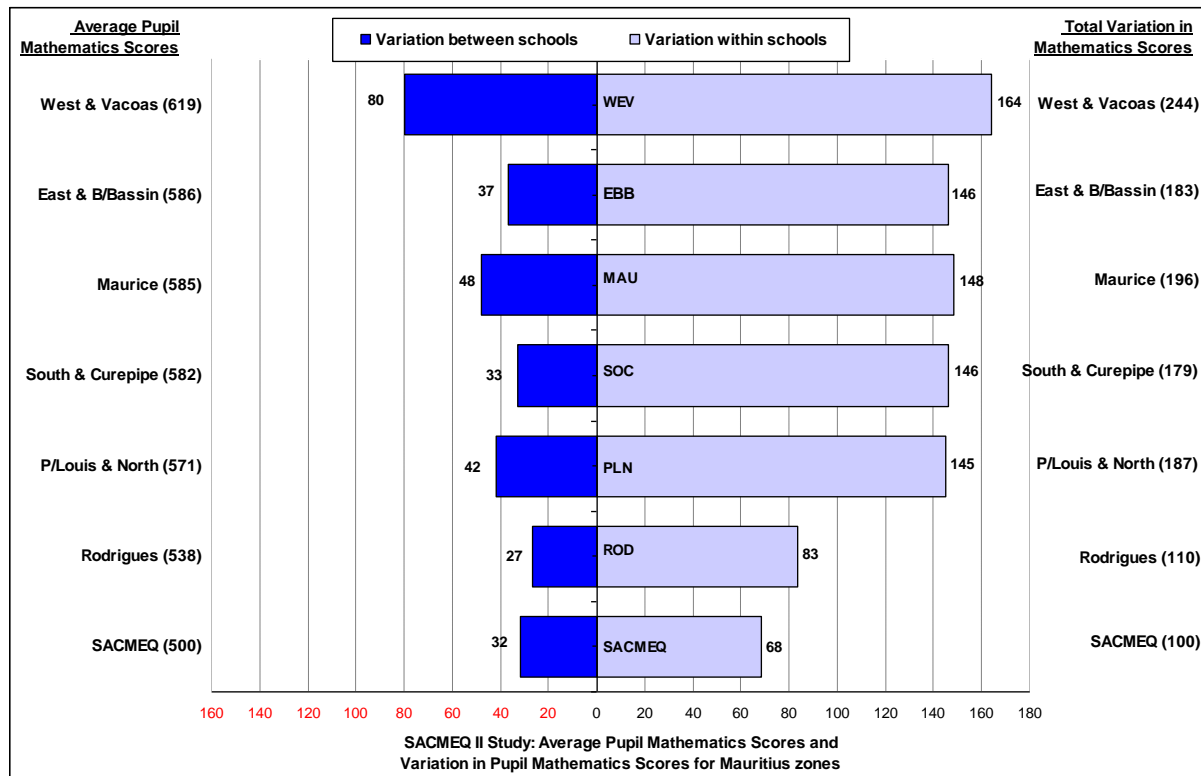


Figure 4: SACMEQ II Study: Average Pupil Maths Score and Variation in Pupil Maths Reading Score

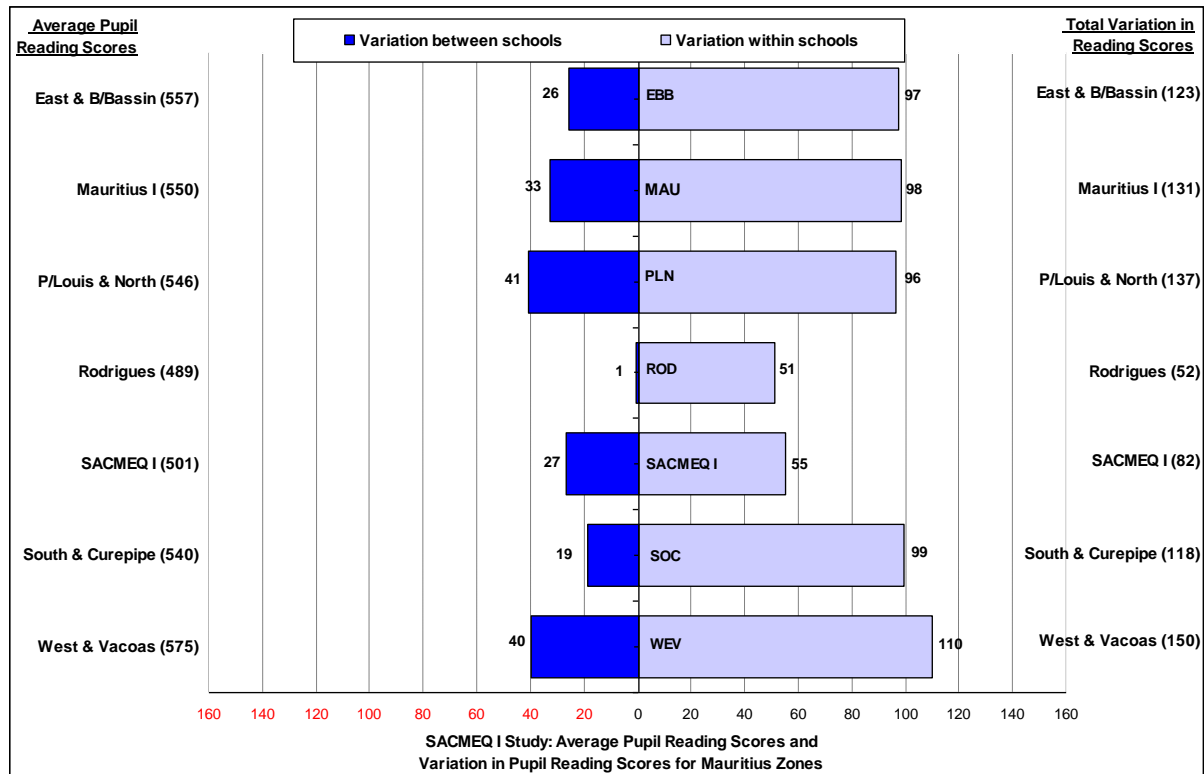


Figure 5: SACMEQ I Study: Average Pupil Reading Score and Variation in Pupil Reading Score **Between-school variance**

An understanding of the quality of schools requires that the schools be analysed in the local context within which they function. Education Zone West & Vacoas comprises central Plaine Wilhems, part of an urban district and Black River, a coastal rural district. Plaine Wilhems is a densely populated area compared to Black River. Plaine Wilhems has a rich residential area but also a predominantly working class population living on the periphery. Black River, basically an agricultural area has a well-developed coastal region owing to the tourist industry but poor remote rural areas are also present. From the point of view of development of basic education as measured by the pass rate at the end of primary education, Zone West & Vacoas is positioned close to the national average but there are wide variations within different locations of the zone. The district of Plaine Wilhems has the highest percentage pass and Black River the lowest.

An effective school is one that achieves better than expected given its intake of pupils. That is to say, on average the pupils achieve better than could be expected given the relationship between achievement and home background. An analysis of the SACMEQ data had been carried out and 15

most effective and 15 less effective schools were identified. Details of the analysis are given in *appendix II*. It is found that among the 15 most effective schools, six of them were found in Zone West & Vacoas, more precisely they were located in the rich urban area. These six schools were high demand schools and since admission was based on the principle of catchment area, many parents living outside the catchment area used unfair means to get their wards admitted to these schools. Zone West & Vacoas had the largest number of high demand schools as compared to other zones. Teachers posted in high demand schools were perceived as high profile teachers whose reputations were judged by the number of their pupils who were admitted to the best secondary schools. They gave extra tuition not only to their pupils but also to pupils from other schools. These teachers were highly motivated. High demand schools have PTAs who were more involved in school management. Nearly all of the rural schools in Zone West & Vacoas were schools with low enrolment and were staffed by less motivated teachers.

In the SACMEQ I study it could be seen that while there was a rather equitable allocation of material resources across schools within zones, there was considerable inequity for a range of human resource inputs and Zone West & Vacoas had large variations in classroom teacher professional qualifications and school head professional qualifications and to a lesser extent for school resources index (Table 5). With the decentralization of education, much of the responsibility for the running of schools resided in the zone directorate. The variations in material resources for Zone West & Phoenix have been reduced but the variations in terms of experience of school heads posted in schools in the zone South & Curepipe remained slightly high.



Table 5: Equity of human resource distribution to schools for both SACMEQ I and II

Human Resources	Variation among schools within zones						Variation among zones
		1	2	3	4	5	
Classroom teacher prof. qual	S I	100.1	72.5	50.1	125.4	118.0	0.0
	S II	109.7	96.6	70.5	107.2	98.1	0.0
Classroom teacher experience	SI	100.4	77.9	61.2	108.2	115.6	7.2
	SII	96.2	98.7	84.7	91.9	106.4	6.0
School head prof. qual	SI	64.6	94.1	93.9	120.3	111.1	5.2
	SII	79.6	95.1	120.9	111.9	101.3	1.3
School head experience	SI	91.7	102.0	121.8	99.1	93.8	2.1
	SII	88.6	76.2	166.4	81.3	101.2	10.6
Insp/advisor visits	SI	89.1	96.7	69.3	104.1	121.7	0.9
Pupil-teacher ratio	SI	118.5	81.4	68.3	105.5	100.4	0.7
	SII	208.0	36.6	33.7	33.1	37.6	0.0

Note: 1= Zone P/Louis & North, 2= Zone East & B.Bassin, 3= Zone South & Curepipe, 4= Zone West & Vacoas, 5= Rodrigues

S I= SACMEQ I, S II= SACMEQ II

**Within-school variance**

The within-school variance was examined for every school in Zone West & Vacoas by looking at the average test score for each Grade 6 class. For most schools a small variation in score was observed among the different classes of that school with a marked variation with one particular class. In other words, in these schools there was one class which was performing poorly. The difference in average test score between the best class and the worst class was taken as a measure of variation within a school. Schools which had a difference larger than 1.5 SD were considered as schools with large variance among pupils within a school and schools having a difference of less than 0.5 SD were considered as schools having a low within-school variation. Nine schools were identified as having large within-school variance for reading and six schools had low variation among their pupils (Tables 6a & 6b). Of the nine schools with large variance, eight were common for largest variance in both reading and mathematics. For the six schools with the lowest variance,

five of them had lowest variance in both reading and mathematics. This is not surprising as pupils are taught by the same teacher for all subjects.

Table 6a: Schools having **largest** within-school variation

	<b>Mean National Reading Score = 536</b> <b>SD = 122</b>		<b>Mean National Maths Score = 585</b> <b>SD = 140</b>	
	<b>School ID</b>	<b>Difference between best and worst class in reading</b>	<b>School ID</b>	<b>Difference between best and worst class in mathematics</b>
	618	361	618	401
	619	360	513	299
	506	271	619	291
	513	250	512	272
	516	231	516	263
	512	224	506	258
	504	221	505	256
	620	215	504	234
	510	193	620	222

Table 6b: Schools having **lowest** within-school variation

	<b>Mean National Reading Score = 536</b> <b>SD = 122</b>		<b>Mean National Maths Score = 585</b> <b>SD = 140</b>	
	<b>School ID</b>	<b>Difference between best and worst class in reading</b>	<b>School ID</b>	<b>Difference between best and worst class in mathematics</b>
	623	3	632	8
	632	5	637	15
	511	14	511	40
	637	15	623	17
	621	39	517	75
	517	52		

It was found that all schools with large variances were high demand schools situated in the central Plaine Wilhems area. They were large schools with an average enrolment of 1100 pupils and had on average five Grade 6 classes. Six of these schools were also among the top 15 effective schools of the country. Pupils in the best classes were high performers and were at skill level 7 or 8 and those in the worst classes were at skill level 2 or 3. Most of the pupils in the worst sections were repeating Grade 6 whereas none of the pupils in the best classes were repeaters. This indicates that in these schools there was a repeater section for those pupils who had failed the examination. This is a form of ability streaming taking place in the schools.

Schools with the lowest variance were smaller schools with an average of two streams. In all such schools pupils in each stream were at skill level 3 or 4 except for one school where pupils were at skill level 6 or 7. In some of these schools repeaters were redistributed among the different existing classes.

How did the pupils in the worst classes in schools with largest variance and pupils in schools with lowest variance differ from the average pupil in this zone? The characteristics of each group of pupils were studied for many of the variables measured. These have been presented in Table 7 below. Where the variables are considered important, the cells have been coloured yellow.

Table 7: Selected variables for pupils in schools with highest and lowest variance in zone West & Vacoas

	<b>All pupils in Zone West &amp; Vacoas</b>	<b>Pupils in the worst classes of schools with largest variance</b>	<b>All pupils in schools with the lowest variance</b>
Mean Reading Score	562 SD=130	449 SD=56	511 SD=118
Mean Reading Level	5 SD=2	3 SD=1	4 SD=2
Mean Maths Score	618 SD=156	521 SD=90	564 SD=165
Mean Maths Level	5	3	4

	SD=2	SD=1.5	SD=2
Pupil age	136 months SD=6	143 months SD=8	136 months SD=6
Pupil sex	50 % boys	61% boys	46% boys
Pupils repeating a grade	16%	70%	20%
Pupils take extra tuition	88.4%	78.5%	82.7%
Days Absent	1.6 days SD=2.3	1.6 days SD=1.9	1.8 days SD=2.8
Mean SES	11 SD=1.8	9.7 SD=1.6	11 SD=1.7
Parent Education	8.0 years SD=2.1	6.8 years SD=1.4	4.0 years SD=0.9 years
Home interest index	11 SD=2	11 SD=1.7	11 SD=2.3
Pupils never speak English at home	31.5%	39.7%	30.7%
No of books at home	41 SD=53	29 SD=34	35 SD=55
Teacher age	46 years SD=8	49 years SD=6	44 years SD=9
Teacher Classroom resources (max=8)	6.2 SD=2.2	4.9 SD=2.7	7.1 SD=0.8
Availability of classroom library	66 %	38.2%	96%
No of classroom library books	38 SD=49	15 SD=19	48 SD=27
Ratio Book:Pupil	1.0 SD=1.3	0.6 SD=0,8	1.4 SD=1.0
Pupils own a reading textbook	95%	90%	97%
Pupils own a maths	95%	90%	97%

textbook			
Teacher has access to teacher guide	30.7%	45%	46%
Pupils given reading homework most days	53.5%	57.1%	39.2%
Homework being corrected most of the time	55.1%	58.1%	68.2%
Teacher meeting parents once a term or more	77%	53%	96%
Total school resources (max=22)	14 SD=2	14 SD=1.9	16 SD=1.5
School head age	54 years SD=2.8	53 years SD=3.3	55 years
School head teaching	126 min/week SD=281	54 min/week SD=29	100 min/week SD=94

It can be seen that 70 percent of pupils in the worst classes in schools with the largest variance were repeaters and consequently they were slightly older, with a higher percentage of boys repeating Grade 6. These pupils came from homes with a lower socio-economic background, they had fewer books at home and about 22 percent of these pupils did not take extra tuition. In class they were exposed to fewer books, fewer pupils had teachers who met with parents.

There was not much difference between pupils in schools with lowest variance compared to the average pupil in Zone West and Phoenix except that their parents had fewer years of education and pupils were given reading homework less often.

## Discussion

This paper has specifically looked at the issue of educational equity by comparing variance in pupil achievement. Large within-school variance was observed across all zones except for Rodrigues. Zone West & Phoenix in particular showed significant between-school variance and the largest within-school variance. The main reason for high within-school variance can be attributed to streaming being practiced in all schools as regard to repeaters of Grade 6 pupils. In 1998 the practice of streaming was abolished in all primary schools. Prior to 1998, pupils admitted to Grade 1 were allocated to the different classes on the basis of age. They remained in the same class group till Grade 4 when they took a national examination and were allocated to Grade 5 on the basis of their results; that is, grouping by ability streaming. With the abolition of the practice of streaming in 1998, pupils are supposed to remain in the same class groups till the end of the primary cycle. The variation in achievement within schools was more pronounced in large schools. In large schools with high enrolment, pupils who fail the CPE examination were grouped in a separate class. In general in the smaller schools the repeaters are redistributed to the various grade 6 classes. With the system of automatic promotion coupled with a lack of remedial education, pupils are pushed up to the next grade even if they have not acquired the minimum skills required. It was found that the pupils in the worst classes were at skill level 3 which is considered to be below that require to cope with learning at Grade 7. It is quite disturbing to note that after seven years of primary schooling, about 18 percent of pupils are still at skill level 3 or below. In Zone West & Phoenix the variance was more pronounced owing to a larger number of large and high demand schools. It will be recalled that Zone West & Phoenix has a densely populated urban area with a larger number of high demand schools.

The effect of streaming is coupled with other operating factors which worsen the chances for these pupils to make significant progress. Within these schools it was observed that pupils in the worst classes came from homes with a lower socio-economic background compared to their counterparts in the other classes. They had fewer books not only at home but also in their class library. There

was less dialogue between their teachers and their parents. A significant number did not take extra tuition. This could probably be due to lack of parental interest and inability to pay for tuition fees. The within-school variation is larger in 2001 compared to the 1995 period. It will be recalled that in 1995 ability streaming was being practiced. This can be accounted for by the quality of repeaters. In 1995 a good number of Grade 6 pupils repeated the grade despite having passed the CPE examination. They were borderline passes and chose to repeat to improve their chance of securing a seat in a secondary school that met their expectation. With expanded access to secondary schools in the period 1995-2001 repetition among CPE graduates who wished to improve their results decreased significantly. Most of the Grade 6 repeaters were those who had failed the CPE examinations.

## **Conclusion**

How did Mauritius fare on the 3 dimensions of access, quality and equity.

Mauritius participated in the SACMEQ I project in 1995. The major finding was that while there was a fairly equitable distribution of material resources in our primary schools , there was some variation in human resource allocation across the zones.

Findings of SACMEQ II study reveal that this Mauritius had a problem of equity.

The EFA challenge for Mauritius is:

to maintain participation rates

to maintain quality by sustaining efforts that will retain high average pupil reading score and high average pupil mathematics score

to initiate measures that will enhance equity by (i) reducing the within school component of variation in pupil scores in Reading and Mathematics (ii) reducing the component of between school variation in both pupil reading scores and pupil Mathematics scores.

Structural changes and teaching changes within schools need to be made. This can be achieved by dismantling streaming in all its forms specially the teaching of repeaters at standard 6 in separate groups. Another measure needs to be taken is to introduce a component in the training programme of primary school teachers which would enable them to adopt teaching strategies that would be suitable for mixed ability teaching. A third measures that is indicated is the review of objectives of inspection with more emphasis to be placed on the monitoring of teaching-learning taking place in the classrooms. Finally inspectors should monitor and ensure that there is no gap between policy and its implementation.



## References

Dolata, S et al. 2004. Different pathways to EFA for different school systems. IIEP Newsletter.

Ross, K.N et al. 2004. Traditional and alternative views of school system performance. IIEP Newsletter.

Postlethwaite, T.N. 2004. Monitoring educational achievement. IIEP.UNESCO

### Using a “Skills Audit” to Identify “Derived” Competence Levels

The SACMEQ tests had been prepared according to systematically-generated test blueprints that described “proposed” levels of competence in reading and mathematics. The results of the Rasch analyses provided a means of assessing whether the levels proposed in the test blueprints in Figures 2.6 and 2.9 were congruent with a detailed examination of the actual test items located at different difficulty levels along the dimensions that had been generated. The descriptions that were obtained after the NRCs had conducted the skills audit were called “derived” levels of competence. The skills audit analyses focussed on the matter of whether the NRCs had actually been able to write test items that were aligned along the five increasing skill levels proposed in the test blueprints.

To address this issue the NRCs examined the 148 items in the “hypothetical” reading test in Figure 2.10 and the set of 91 items in the “hypothetical” mathematics test in Figure 2.11. The two sets of items were first arranged in order of difficulty, and then examined item-by-item in order to describe the specific skills required to provide correct responses. When items had been linked to specific skills they were placed into groups of test items such that the items in each group had similar difficulty values and shared a common “theme” with respect to the underpinning competencies required to provide correct responses.

The three tasks of defining specific skills for each test item, identifying groups of items with similar difficulties, and then naming the “theme” (or competency level) linked to each group were extremely difficult because it required the NRCs to first reach agreement on how the respondents arrived at correct solutions, and to then name the competency required. This required the NRCs to

use their practical knowledge of the ways in which pupils solve problems, and then to portray this with a meaningful description of the thought processes that had been applied. The next step was to compare the “proposed” levels of competence to the “derived” levels of competence in order to check the accuracy of the item writers’ skills and the validity of the test.

### **Reading and Mathematics Competencies Generated from the Skills Audit**

The skills audit for the reading and mathematics tests resulted in the identification of eight levels of competence for each test. This was more than had been proposed in the test blueprints.

**For both tests there was a strong correspondence between the descriptions of the five blueprint levels and most of the derived levels arising from the skills audit – which suggested that the three “extra” levels were defining more detail on the same reading and mathematics scales. That is, the overall dimensions remained substantially the same, but the skills audit meant that the empirically-generated (or “derived”) dimensions of reading and mathematics were, as expected, somewhat more detailed than the subjectively described (or “proposed”) dimensions used to stimulate test and item development.**

## **Levels of Reading Competency Generated from Skills Audit**

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

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

#### **(b) Example Test Items**

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

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

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

#### **(b) Example Test Items**

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

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

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

#### **(b) Example Test Items**

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

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

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

**(b) Example Test Items**

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

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

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

#### **(b) Example Test Items**

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

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

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

#### **(b) Example Test Items**

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

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

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

#### **(b) Example Test Items**

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

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

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

**(b) Example Test Items**

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

## Levels of Mathematics Competency Generated from Skills Audit

---

### **Level 1: Pre Numeracy (Linked with Level 1 in the Test Blueprint)**

**(a) Skills:** Applies single step addition or subtraction operations. Recognizes simple shapes. Matches numbers and pictures. Counts in whole numbers.

#### **(b) Example Test Items**

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

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

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

#### **(b) Example Test Items**

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

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

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



**(b) Example Test Items**

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

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

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

**(b) Example Test Items**

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

---

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

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

**(b) Example Test Items**

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

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

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

**(b) Example Test Items**

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

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

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

**(b) Example Test Items**

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

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

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

**(b) Example Test Items**

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

### *An Effective Schools' Analysis*

An effective school is one that achieves better than expected given its intake of pupils. That is to say, on average the pupils achieve better than could be expected given the relationship between achievement and home background for all Standard 6 pupils in the country. By definition, an ineffective school is therefore one that achieves less well than expected given its intake of pupils. What is meant by 'given its intake of pupils'? In general, pupils from better homes have higher achievement scores than pupils from poorer homes. What is meant by a 'good or poor home'? Good homes are those where the parents have a high level of education, where there are many possessions in the home because the parents have sufficient money to buy the possessions. A good home is in the better conditions in terms of its roof, floor, and wall, therefore children can have a more stable life.

In the preceding chapters, the differences between good schools and poor schools in terms of achievement have been presented. But, at the same time it is important to examine the differences between the more and less effective schools. Those schools with a poor intake of pupils in socio-economic terms and yet performing well can point to what policies may be followed by the authorities to improve the effectiveness of all schools.

There were 159 schools in the sample. In the analysis the 15 most effective schools and the 15 least effective schools were identified and the differences between these two extreme groups for many of the variables measured were calculated.

## Method of analysis

A home background factor (a principal component) was formed of the following variables with the following loadings:

Variable	Loading
Parental education	,563
Total possessions at home	,654
Floor material	,538
Wall material	,606
Roof material	,647

The correlation between this home background factor and reading achievement was 0.36 and with mathematics achievement it was 0.34. As expected, pupils with higher values on the home background factor tended to obtain higher scores both in reading and in mathematics.

A simple bivariate regression line was established between the home background factor and the pupil scores on a) the reading test, and b) the mathematics test. The pupils placed above the regression line were interpreted as having reading scores (or mathematics) scores that were better than could be expected – after taking the home background into account. Conversely, pupils placed below the line had scores that were worse than might be expected.

The residual (actual minus predicted scores) scores were then averaged over schools so that a school with a very high mean residual score was identified as a ‘more effective’ school because it had many pupils whose achievement scores were much higher than expected. (This procedure also avoids aggregation effects that would have occurred if the procedure had been carried out at the between school level only).

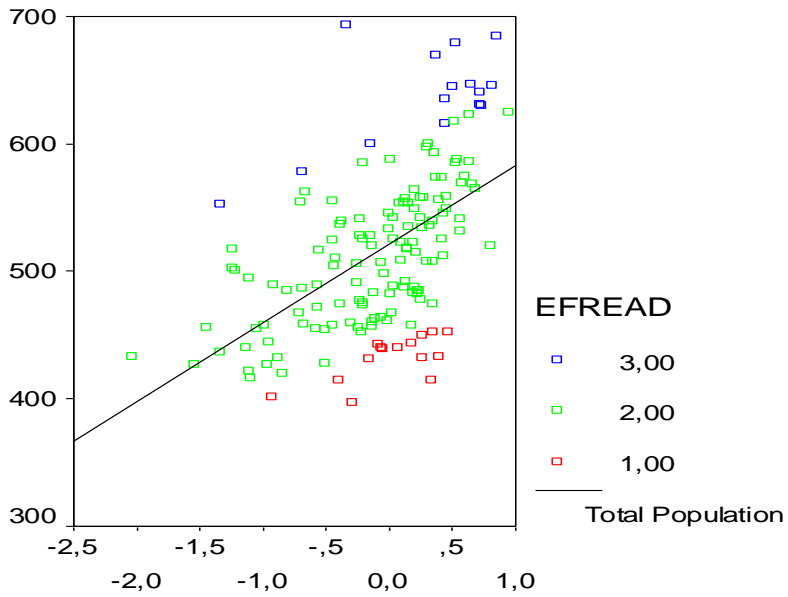
It is important to note that this definition of a ‘more effective’ school made it possible for a school to be designated as effective even if it had a relatively low raw mean score – perhaps even considerably lower than the average for all schools in the country. Similarly, a school with a

relatively high mean score might after considering the home background of its pupils be designated as a 'less effective' school.

For each score (reading and mathematics), top 10 percent of 'more effective' school (15 schools in total) are grouped as 'most effective' school and bottom 10 percent of 'less effective' school (15 schools in total) are grouped as 'least effective' school. Variables, which were different between these two groups, were identified. In Figures B.1 and B.2 below, the most effective schools have been marked in blue. It can be seen that they are well above the regression line. In reading (Figure B.1) it can be seen that there are four schools with relatively low home background scores and yet have relatively high mean reading scores. The least effective schools have been marked in red. It can be seen that there are some schools with a socio-economic background that is quite high (+0.5) and yet their reading achievement was low (a Rasch mean score of 400 to 450). One wonders why these schools are performing at such a low level. There is a similar picture for mathematics.

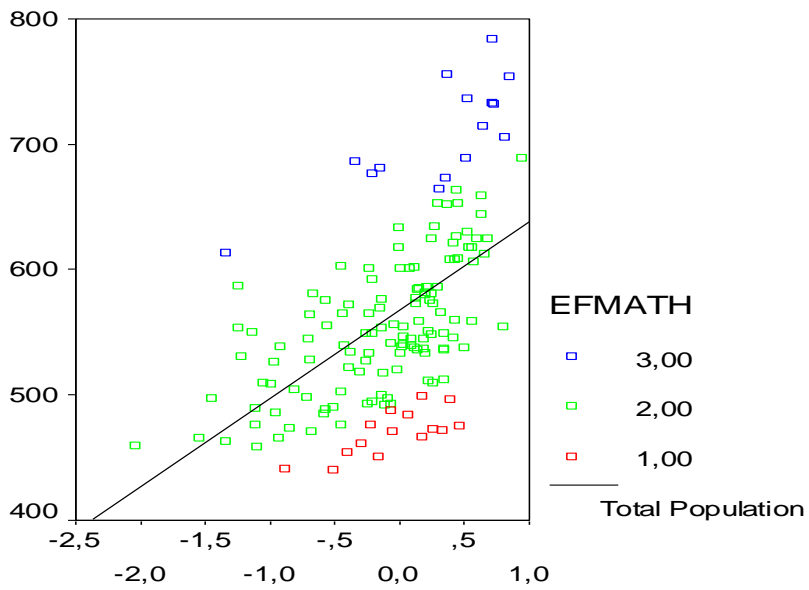
It should also be noted that there are some schools with a high home background measure and that are still performing better than expected. These must be remarkable schools.

It should be pointed out that the aim of the analyses presented in this chapter comparing the more and less effective schools had not been to establish precise measures of the effects of various variables on mean pupil reading scores as might be undertaken using complex and hierarchical causal modelling. Rather the aim is to identify a summary list of variables that will be of interest to planners and to others undertaking further analyses of the data.



school mean pupil home background

**Figure B.1: Scatter plot of school mean home background and reading scores**



school mean pupil home background

**Figure B.2: Scatter plot of school mean home background and mathematics scores**

## **Identification of schools**

After completing the analyses mentioned above in order to identify the 15 least and 15 most effective schools, they were listed in Table B.1. The schools for reading are on the left hand side of the table and the schools for mathematics on the right. In each case the zone and school IDs appear in the first two columns. The residual score is in the third column. The residual is the actual score (in the fourth column) minus the predicted score that has not been reproduced here. For the first school in the reading table the ID is 106. It had an actual reading score of 416.56. Its predicted score (the score it should have obtained given its socio-economic intake of pupils) was 535.40. It was scoring 119.84 less than it should have been achieving. It was the least effective school in these analyses.

When examining the least effective schools for reading and for mathematics it can be seen that there were eleven out of the fifteen schools that were the same. There were ten schools common for mathematics and reading among the most effective schools. This suggests that some schools are in general underachieving or overachieving. These schools are well known to the inspectorate in Mauritius and this analysis confirms the inspectorate's views.



**Table B.1 Bottom 15 and Top 15 schools**

Zone	School ID	Read Residual	Read Score	Region	School ID	Math Residual	Math Score
MAU:PLN	106	-119,84	415,56	MAU:WEV	623	-114,04	475,23
MAU:PLN	132	-110,59	397,52	MAU:EBB	604	-111,11	466,39
MAU:PLN	108	-104,43	433,56	MAU:PLN	106	-110,29	471,91
MAU:SOC	519	-99,19	433,14	MAU:PLN	211	-109,74	451,08
MAU:PLN	130	-88,54	415,26	MAU:SOC	519	-106,72	473,31
MAU:WEV	623	-87,86	453,18	MAU:PLN	105	-103,43	440,44
MAU:EBB	604	-84,24	444,53	MAU:PLN	130	-102,58	454,24
MAU:PLN	238	-83,27	440,77	MAU:SOC	524	-98,63	471,12
MAU:PLN	225	-83,15	453,02	MAU:PLN	132	-91,16	461,82
MAU:PLN	211	-82,37	431,85	MAU:PLN	108	-87,49	496,64
MAU:EBB	601	-82	450,24	MAU:PLN	238	-86,62	484,61
MAU:SOC	400	-78,65	402,04	MAU:PLN	127	-86,36	440,97
MAU:SOC	524	-78,5	440,19	MAU:SOC	445	-81,62	476,27
MAU:WEV	630	-77,75	440,48	MAU:WEV	630	-76,88	488,2
MAU:PLN	102	-74,25	443,03	MAU:PLN	222	-76,64	499,72
Zone	School ID	Read Residual	Read Score	Region	School ID	Math Residual	Math Score
MAU:EBB	305	76,27	616,15	MAU:PLN	206	81,98	664,19
MAU:PLN	109	77,81	630,69	MAU:EBB	616	89,53	673,15
MAU:WEV	619	79,69	631,72	MAU:EBB	608	99,89	689,4
MAU:PLN	118	86,28	601,03	MAU:WEV	507	100,12	705,77
MAU:SOC	435	87,7	578,62	MAU:WEV	514	107,68	614,01
MAU:WEV	621	88,46	640,72	MAU:WEV	618	117,6	715,16
MAU:WEV	514	89,94	552,78	MAU:WEV	504	118,18	676,79
MAU:WEV	507	90,19	646,67	MAU:PLN	118	123,26	681,72
MAU:PLN	121	95,52	635,59	MAU:PLN	109	128,26	732,66
MAU:WEV	618	98,41	647,27	MAU:WEV	619	131,83	732,76
MAU:EBB	357	102,71	645,44	MAU:ROD	702	134,31	686,89
MAU:SOC	520	127,48	685,27	MAU:EBB	341	144,71	737
MAU:WEV	516	133,19	669,99	MAU:SOC	520	147,47	754,51
MAU:EBB	341	135,86	679,75	MAU:WEV	516	171,17	755,96
MAU:ROD	702	187,32	693,78	MAU:WEV	621	182,14	784,18

## Results

Comparisons were then made between the groups of schools for many of the variables in the study. The results have been presented in Table B.2. For each variable the mean of the top 15 schools (the most effective schools) has been presented. This has been followed by the mean of the 15 least effective schools and then the overall standard deviation. Finally, the difference has been presented. Where the difference between the values for the most and least effective schools was greater than one standard deviation, cells have been coloured in blue, half a standard deviation then yellow. Where the difference was smaller than half of a standard deviation, the difference cell has been left white.

**Table B.2:** Differences between most and least effective schools

<b>Reading</b>					<b>Math</b>				
	<b>Bottom 15</b>	<b>Top 15</b>	<b>SD</b>	<b>Difference</b>		<b>Bottom 15</b>	<b>Top 15</b>	<b>SD</b>	<b>Difference</b>
Pupil age in months	136,32	134,84	5,85	-0,25	Pupil age in months	136,48	134,64	5,85	-0,31
Pupil sex (ratio female)	0,47	0,49	0,50	0,05	Pupil sex (ratio female)	0,47	0,50	0,50	0,05
Speak English outside school (ratio speaking)	0,48	0,79	0,48	0,66	Speak English outside school (ratio speaking)	0,44	0,80	0,48	0,73
Books at home (books)	22,45	59,47	51,09	0,72	Books at home (books)	23,60	59,57	51,09	0,70
Meals per week (meals)	11,41	11,68	1,05	0,26	Meals per week (meals)	11,42	11,69	1,05	0,26
Days absent (days)	2,16	1,46	2,48	-0,28	Days absent (days)	2,20	1,46	2,48	-0,30
Repeat grades (times)	0,24	0,11	0,39	-0,34	Repeat grades (times)	0,24	0,10	0,39	-0,36
Place to sit (ratio having)	1,00	1,00	0,00	0,00	Place to sit (ratio having)	1,00	1,00	0,00	0,00
Place to write (ratio having)	1,00	1,00	0,00	0,00	Place to write (ratio having)	1,00	1,00	0,00	0,00
Make sure for homework	3,52	3,45	0,62	-0,12	Make sure for homework	3,50	3,32	0,62	-0,29
Help for homework	3,13	3,17	0,55	0,08	Help for homework	3,09	3,08	0,55	-0,02
Ask to read	2,23	2,23	0,60	-0,01	Ask to read	2,13	2,19	0,60	0,10
Ask to do mathematical calculations	1,99	2,26	0,57	0,48	Ask to do mathematical calculations	1,94	2,25	0,57	0,55
Ask questions about reading	2,11	2,29	0,58	0,32	Ask questions about reading	2,15	2,16	0,58	0,03
Ask questions about mathematics	2,12	2,26	0,58	0,24	Ask questions about mathematics	2,10	2,20	0,58	0,17
Look at the work done in school	2,21	2,37	0,61	0,26	Look at the work done in school	2,20	2,30	0,61	0,15
English extra tuition	1,74	1,78	0,42	0,10	English extra tuition	1,71	1,71	0,42	0,01
Math extra tuition	1,73	1,81	0,42	0,20	Math extra tuition	1,70	1,74	0,42	0,10
Other extra tuition	1,75	1,92	0,38	0,46	Other extra tuition	1,72	1,87	0,38	0,41
Take extra tuition	0,79	0,97	0,34	0,51	Take extra tuition	0,77	0,93	0,34	0,46
Paying extra tuition (ratio paying)	0,81	0,91	0,27	0,39	Paying extra tuition (ratio paying)	0,85	0,89	0,27	0,15
Get Reading homework	3,09	3,11	0,85	0,02	Get Reading homework	3,03	3,12	0,85	0,10
Reading homework corrected	3,94	3,42	1,17	-0,45	Reading homework corrected	3,96	3,65	1,17	-0,26
Get Math homework	3,69	3,79	0,63	0,16	Get Math homework	3,51	3,75	0,63	0,39
Math homework corrected	4,67	4,53	0,88	-0,15	Math homework corrected	4,66	4,47	0,88	-0,21
Math textbooks used	4,94	4,88	0,30	-0,17	Math textbooks used	4,94	4,83	0,30	-0,36
Teacher sex (1=male 2=female)	1,26	1,26	0,45	0,00	Teacher sex (1=male 2=female)	1,21	1,23	0,45	0,02
Teacher age	43,67	46,08	8,02	0,30	Teacher age	43,30	46,99	8,02	0,46
Teacher academic education	3,46	3,46	0,58	0,01	Teacher academic education	3,48	3,31	0,58	-0,28

Teacher professional training	4,11	4,22	0,86	0,13	Teacher professional training	4,22	4,17	0,86	-0,06	
Teacher teaching years (years)	21,69	23,70	8,60	0,23	Teacher teaching years (years)	20,43	24,68	8,60	0,49	
Number of teacher in-service courses (courses)	1,83	2,55	2,43	0,30	Number of teacher in-service courses (courses)	2,18	1,69	2,43	-0,20	
Days of teacher in-service courses (days)	8,48	23,51	31,57	0,48	Days of teacher in-service courses (days)	12,20	26,14	31,57	0,44	
Effectiveness of teacher in-service courses	2,16	3,03	1,40	0,62	Effectiveness of teacher in-service courses	2,32	2,62	1,40	0,21	
Books in class (books)	21,96	41,04	30,86	0,62	Books in class (books)	23,53	39,01	30,86	0,50	
Sitting places (places)	34,96	40,93	7,35	0,81	Sitting places (places)	35,05	41,49	7,35	0,88	
Writing places (places)	34,75	41,05	7,53	0,84	Writing places (places)	34,82	41,58	7,53	0,90	
Periods of teaching per week (periods)	24,37	24,47	3,58	0,03	Periods of teaching per week (periods)	25,12	23,86	3,58	-0,35	
Minutes teaching per period (minutes)	50,78	49,29	7,00	-0,21	Minutes teaching per period (minutes)	49,77	50,29	7,00	0,07	
Hours spent for preparation and marking per week (hours)	8,88	14,55	8,16	0,70	Hours spent for preparation and marking per week (hours)	8,29	14,04	8,16	0,71	
Frequency of meeting parents	2,58	3,18	0,80	0,75	Frequency of meeting parents	2,69	3,02	0,80	0,41	
Percentage of meeting parents	28,15	58,49	26,40	1,15	Percentage of meeting parents	27,39	50,71	26,40	0,88	meet more parents,
Advice from school heads	3,36	3,03	0,92	-0,36	Advice from school heads	3,62	3,27	0,92	-0,38	
Total classroom resources (max=8)	6,07	6,47	2,26	0,18	Total classroom resources (max=8)	6,29	6,39	2,26	0,04	
READING ACTIVITY-LISTEN	2,86	2,98	0,34	0,36	MATH ACTIVITY-PAIRS	2,66	2,67	0,51	0,03	
READING ACTIVITY-SILENT READING	2,81	2,91	0,37	0,25	MATH ACTIVITY-ALONE	2,31	2,58	0,61	0,44	
READING ACTIVITY-NEW VOC	2,96	3,00	0,19	0,23	MATH ACTIVITY-POSTERS	2,49	2,44	0,56	-0,09	
READING ACTIVITY-SOUND WORDS	2,92	2,97	0,28	0,17	MATH ACTIVITY-EQUIPMENT	2,81	2,76	0,36	-0,14	
READING ACTIVITY-COMPREHENSION	2,97	3,00	0,13	0,20	MATH ACTIVITY-HOMEWORK	2,78	2,52	0,48	-0,54	
READING ACTIVITY-HOME READ	2,83	2,96	0,30	0,43	MATH ACTIVITY-GRAPHS	2,74	2,63	0,54	-0,20	
READING ACTIVITY-MATERIAL HOME	2,73	2,95	0,34	0,66	MATH ACTIVITY-RECITE	2,50	2,47	0,63	-0,05	
READING ACTIVITY-READ ALOUD	2,80	2,94	0,43	0,31	MATH ACTIVITY-QUIZZ	2,79	2,78	0,43	-0,03	
READING GOAL-ENJOY	2,99	2,93	0,25	-0,26	MATH GOAL-NUMERARY	3,00	2,95	0,21	-0,24	
READING GOAL-VOCABULARY	2,86	2,97	0,29	0,38	MATH GOAL-PROBLEM SOLVE	2,99	2,93	0,19	-0,30	
READING GOAL-WORD ATTACK	2,80	2,91	0,44	0,24	MATH GOAL-THINKING	2,95	2,95	0,28	-0,02	
READING GOAL-COMPREHENSION	2,98	2,99	0,20	0,02	MATH GOAL-CONFIDENCE	2,82	2,91	0,36	0,23	
READING GOAL-INTEREST	2,96	2,88	0,27	-0,29	MATH GOAL-SATISFACTION	2,76	2,82	0,38	0,15	
READING GOAL-CAREER	2,40	2,61	0,61	0,35	MATH GOAL-CAREER	2,56	2,42	0,56	-0,26	
READING GOAL-LIFE SKILLS	2,59	2,68	0,51	0,18	MATH GOAL-LIFE SKILLS	2,77	2,61	0,48	-0,32	
READING APPROACH-BKGD	2,85	2,68	0,46	-0,38	MATH APPROACH-EVERYDAY	2,65	2,80	0,45	0,32	
READING APPROACH-COMPREH	2,89	2,95	0,25	0,26	MATH APPROACH-WHOLE CLASS	2,79	2,77	0,42	-0,03	
READING APPROACH-UNDERSTAND	2,79	2,95	0,38	0,42	MATH APPROACH-SMALL GRP	2,22	2,15	0,56	-0,12	
READING APPROACH-MATERIALS	2,25	2,24	0,59	-0,01	MATH APPROACH-INDIVIDUAL	2,09	2,27	0,64	0,29	

READING APPROACH-READ ALOUD	2,82	2,97	0,36	0,41	MATH APPROACH-Q&A	2,85	2,76	0,39	-0,23	
READING APPROACH-FEEDBACK	2,80	2,85	0,43	0,12	MATH APPROACH-FEEDBACK	2,80	2,77	0,42	-0,06	
Reading test given	5,14	5,16	0,95	0,02	MATH APPROACH-RELATE	2,77	2,80	0,44	0,06	
Ask parents to sign the completion of home assignment	1,18	1,40	0,45	0,50	MATH APPROACH-BASIC SKILL	2,91	2,92	0,39	0,02	
					MATH APPROACH-PROCESS	2,93	2,98	0,30	0,16	
					MATH APPROACH-LOCAL MAT	2,75	2,85	0,42	0,25	
					Math test given	5,02	5,10	0,84	0,10	
					Ask parents to sign the completion of home assignment	1,14	1,44	0,47	0,64	
School head sex (1=male 2=female)	1,41	1,45	0,47	0,08	School head sex (1=male 2=female)	1,33	1,44	0,47	0,23	
School head age	52,98	53,13	3,53	0,04	School head age	52,37	53,49	3,53	0,32	
School head academic education	3,67	3,44	0,63	-0,36	School head academic education	3,53	3,56	0,63	0,05	
School head teacher training	4,36	4,35	0,83	-0,02	School head teacher training	4,28	4,47	0,83	0,23	
School head having special training (weeks)	30,35	26,89	30,93	-0,11	School head having special training (weeks)	24,00	28,22	30,93	0,14	
School head years of teaching (years)	30,78	31,79	4,23	0,24	School head years of teaching (years)	29,94	31,83	4,23	0,45	
School head periods of teaching per week (periods)	1,96	5,45	3,56	0,98	School head periods of teaching per week (periods)	2,71	4,89	3,56	0,61	
School head teaching minutes per period (minutes)	35,84	40,03	9,80	0,43	School head teaching minutes per period (minutes)	33,88	40,13	9,80	0,64	
Being school head in this school (years)	1,95	1,95	1,41	0,00	Being school head in this school (years)	1,60	2,41	1,41	0,57	
Being school head altogether (years)	3,13	4,01	2,21	0,40	Being school head altogether (years)	2,67	4,91	2,21	1,01	
Type of school (1=government 2=private)	1,13	1,26	0,41	0,32	Type of school (1=government 2=private)	1,08	1,19	0,41	0,28	
Year school established	1947,98	1956,95	31,47	0,28	Year school established	1948,33	1949,04	31,47	0,02	
Distance from clinic (km)	1,76	2,67	1,84	0,49	Distance from clinic (km)	1,49	2,23	1,84	0,40	
Distance from tarmac road (km)	1,00	1,00	0,11	0,00	Distance from tarmac road (km)	1,00	1,00	0,11	0,00	
Distance from public library (km)	4,20	2,20	3,98	-0,50	Distance from public library (km)	4,83	2,01	3,98	-0,71	
Distance from book shop (km)	4,14	1,99	3,45	-0,62	Distance from book shop (km)	3,81	1,42	3,45	-0,69	
Distance from secondary school (km)	4,31	3,80	3,72	-0,14	Distance from secondary school (km)	2,91	3,11	3,72	0,05	
Distance from market (km)	3,14	1,47	2,30	-0,73	Distance from market (km)	2,41	1,19	2,30	-0,53	
School location (1=isolated 2=rural 3=town 4=city)	3,23	3,37	0,95	0,15	School location (1=isolated 2=rural 3=town 4=city)	3,23	3,55	0,95	0,35	
Permanent male teachers (teachers)	9,75	14,20	6,43	0,69	Permanent male teachers (teachers)	8,34	14,39	6,43	0,94	
Permanent female teachers (teachers)	11,01	19,36	6,79	1,23	Permanent female teachers (teachers)	11,05	19,22	6,79	1,20	
Temporary male teachers (teachers)	0,00	0,00	0,20	0,00	Temporary male teachers (teachers)	0,00	0,00	0,20	0,00	
Temporary female teachers (teachers)	0,00	0,06	0,54	0,11	Temporary female teachers (teachers)	0,00	0,06	0,54	0,11	
Student male teachers (teachers)	0,49	0,57	0,75	0,11	Student male teachers (teachers)	0,55	0,51	0,75	-0,05	
Student female teachers (teachers)	0,96	2,41	2,04	0,71	Student female teachers (teachers)	1,15	2,94	2,04	0,88	
Total number of teachers (teachers)	22,21	36,61	11,94	1,21	Total number of teachers (teachers)	21,09	37,12	11,94	1,34	

Up to secondary teachers (teachers)	20,39	32,64	10,60	1,16	Up to secondary teachers (teachers)	19,25	32,83	10,60	1,28	
Tertiary teachers (teachers)	0,36	0,99	2,29	0,27	Tertiary teachers (teachers)	0,14	0,84	2,29	0,30	
No teacher training teachers (teachers)	0,00	1,67	2,20	0,76	No teacher training teachers (teachers)	0,00	2,00	2,20	0,91	
Short course training teachers (teachers)	1,03	0,13	1,27	-0,71	Short course training teachers (teachers)	0,00	0,13	1,27	0,10	
1 year training teachers (teachers)	1,57	3,07	4,69	0,32	1 year training teachers (teachers)	1,54	4,41	4,69	0,61	
2 years training teachers (teachers)	18,16	25,32	12,40	0,58	2 years training teachers (teachers)	17,85	21,29	12,40	0,28	
3 years training teachers (teachers)	0,00	2,42	6,55	0,37	3 years training teachers (teachers)	0,00	2,45	6,55	0,37	
3+ years teacher training teachers (teachers)	0,00	1,02	6,99	0,15	3+ years teacher training teachers (teachers)	0,00	3,39	6,99	0,48	
Number of boys	277,07	460,84	172,14	1,07	Number of boys	261,48	451,70	172,14	1,11	bigger school, better
Number of girls	253,67	447,04	162,60	1,19	Number of girls	241,02	446,00	162,60	1,26	
Number of G6 boys	62,54	89,51	35,45	0,76	Number of G6 boys	62,44	85,83	35,45	0,66	
Number of G6 girls	56,90	86,01	31,54	0,92	Number of G6 girls	55,77	85,60	31,54	0,95	
Number of classes	15,87	22,36	6,81	0,95	Number of classes	15,30	22,49	6,81	1,06	
Number of G6 classes	3,54	4,41	1,44	0,61	Number of G6 classes	3,54	4,28	1,44	0,51	
Pupils in session1	530,73	907,88	331,72	1,14	Pupils in session1	502,50	897,70	331,72	1,19	
Classes in session1	15,87	22,36	6,81	0,95	Classes in session1	15,30	22,49	6,81	1,06	
Number of inspections since 1998	57,23	23,46	47,78	-0,71	Number of inspections since 1998	55,60	37,74	47,78	-0,37	
Number of full inspections	3,50	0,84	9,98	-0,27	Number of full inspections	4,81	6,96	9,98	0,22	
Number of routine inspections	48,78	48,81	34,60	0,00	Number of routine inspections	40,50	51,83	34,60	0,33	
Number of teacher (non promotion) inspections	49,86	25,45	37,23	-0,66	Number of teacher (non promotion) inspections	40,82	34,08	37,23	-0,18	
Number of teacher (promotion) inspections	0,42	0,54	7,95	0,02	Number of teacher (promotion) inspections	2,22	1,08	7,95	-0,14	
Number of assist teaching inspections	37,73	25,83	32,26	-0,37	Number of assist teaching inspections	39,74	23,76	32,26	-0,50	
Number of advice management inspections	25,45	21,66	22,07	-0,17	Number of advice management inspections	24,27	21,62	22,07	-0,12	
Number of addressing problem inspections	2,43	1,61	4,25	-0,19	Number of addressing problem inspections	2,50	3,48	4,25	0,23	
Number of other inspections	9,87	7,44	14,36	-0,17	Number of other inspections	10,22	11,86	14,36	0,11	
Importance of activity-CONTACT local community	2,94	2,62	0,47	-0,66	Importance of activity-CONTACT local community	2,94	2,43	0,47	-1,08	less effective school
Importance of activity-MONITOR	3,00	3,00	0,21	0,00	Importance of activity-MONITOR	3,00	3,00	0,21	0,00	
Importance of activity-ADMIN	3,00	2,94	0,34	-0,19	Importance of activity-ADMIN	3,00	2,94	0,34	-0,19	
Importance of activity-DISCUSS	3,00	3,00	0,18	0,00	Importance of activity-DISCUSS	3,00	3,00	0,18	0,00	
Importance of activity-TEACHERS PROF. DEV	3,00	2,87	0,37	-0,35	Importance of activity-TEACHERS PROF. DEV	2,93	2,87	0,37	-0,15	
Importance of activity-HEAD PROF.DEV	2,94	2,87	0,39	-0,17	Importance of activity-HEAD PROF.DEV	2,93	2,87	0,39	-0,14	
Total pupil problems	30,55	26,94	4,32	-0,84	Total pupil problems	31,57	26,39	4,32	-1,20	
Total teacher problems	13,29	12,53	1,62	-0,47	Total teacher problems	13,45	12,45	1,62	-0,62	
Total school resources	14,83	15,81	2,07	0,47	Total school resources	14,37	15,56	2,07	0,57	

Production of school magazine	1,20	1,39	0,44	0,43	Production of school magazine	1,14	1,33	0,44	0,43	
Public speaking day	1,00	1,47	0,42	1,13	Public speaking day	1,13	1,41	0,42	0,65	
Open-door policy at any day	1,86	1,94	0,39	0,20	Open-door policy at any day	1,86	1,93	0,39	0,19	
Open-door policy for a special day	1,55	1,56	0,49	0,02	Open-door policy for a special day	1,54	1,61	0,49	0,15	
Debating contests	1,06	1,34	0,37	0,77	Debating contests	1,12	1,21	0,37	0,24	
School days lost	7,36	6,97	6,65	-0,06	School days lost	7,03	6,56	6,65	-0,07	
Permanent classrooms	18,10	24,94	7,13	0,96	Permanent classrooms	17,56	24,66	7,13	1,00	
Temporary classrooms	0,26	0,60	0,76	0,46	Temporary classrooms	0,32	0,61	0,76	0,38	
Open-air classrooms	0,00	0,07	0,26	0,28	Open-air classrooms	0,00	0,07	0,26	0,28	
Permanent areas	1124,69	955,90	1124,91	-0,15	Permanent areas	1044,87	984,05	#####	-0,05	
Temporary areas	9,21	16,52	26,11	0,28	Temporary areas	6,74	16,75	26,11	0,38	
School building conditions	3,86	3,84	1,11	-0,02	School building conditions	3,77	3,64	1,11	-0,11	
Toilets for boys	1,00	1,00	0,19	0,00	Toilets for boys	1,00	1,00	0,19	0,00	
Toilets for girls	1,00	1,00	0,19	0,00	Toilets for girls	1,00	1,00	0,19	0,00	
Toilets for staffs	1,00	1,00	0,17	0,00	Toilets for staffs	1,00	1,00	0,17	0,00	
Can borrow books	2,68	2,75	0,62	0,10	Can borrow books	2,47	2,75	0,62	0,46	
Community contribution	2,96	4,59	1,79	0,91	Community contribution	3,25	4,24	1,79	0,55	
Lack of cooperation from the community	2,18	1,34	0,71	-1,19	Lack of cooperation from the community	2,19	1,47	0,71	-1,02	Cooperation from co

If variables are selected as important that are yellow and blue for both subjects then those schools that were more effective in 2001 in Mauritius can be said to have the following characteristics.

(a) Home and community

Despite the fact that the material conditions of the home and parental education were used as a measure of home background it nevertheless emerged that school that had pupils whose parents spoke English more at home and also had more books at home were more effective in both subject areas. The more the School Head perceived the parents to be contributing to the school and the more the parents co-operated with the school, then the more effective the schools were. Schools that were nearer to public facilities tended to be among the more effective schools.

(b) School-community interactions

The higher the percentage of parents met by teachers the more effective was the school. The less the School Head perceived that his having regular contact with the community (but since effective schools have parents that co-operate, then this must mean that in schools where parents do not co-operate, Heads see it as more important to establish contacts with the community), the more effective was the school.

(c) Classrooms and teachers

More effective schools had more classroom libraries, sufficient sitting and writing places, and teachers who spent more time marking homework and preparing lessons.

(d) Schools and School Heads

Effective schools had school heads who taught more each week and as mentioned above who interacted with the community and parents. Effective schools tended also to be the larger schools with more teachers and pupils.

**Table B.3 Bottom 15 and Top 15 schools**

<b>Reading</b>			<b>Mathematics</b>		
<b>Region</b>	<b>School ID</b>	<b>School Name</b>	<b>Region</b>	<b>School ID</b>	<b>School Name</b>
MAU:PLN	106	La Tour Koenig GS (New)	MAU:WEV	623	Belle Rose RC
MAU:PLN	132	Marcel Cabon GS	MAU:EBB	604	Rose Hill Central GS
MAU:PLN	108	Dr O. Beaugeard GS	MAU:PLN	106	La Tour Koenig GS (New)
MAU:SOC	519	Rev E. Noel GS	MAU:PLN	211	P. aux Piments GS
MAU:PLN	130	E. Anquetil GS	MAU:SOC	519	Rev E. Noel GS
MAU:WEV	623	Belle Rose RC	MAU:PLN	105	Pointe aux Sables GS
MAU:EBB	604	Rose Hill Central GS	MAU:PLN	130	E. Anquetil GS
MAU:PLN	238	Sir S. Ramgoolam GS	MAU:SOC	524	Wooton GS
MAU:PLN	225	Grand Bay GS	MAU:PLN	132	Marcel Cabon GS
MAU:PLN	211	P. aux Piments GS	MAU:PLN	108	Dr O. Beaugeard GS
MAU:EBB	601	Stanley GS	MAU:PLN	238	Sir S. Ramgoolam GS
MAU:SOC	400	Sainte Cecile RC	MAU:PLN	127	La Briquetterie GS
MAU:SOC	524	Wooton GS	MAU:SOC	445	Bel Ombre GS
MAU:WEV	630	Bambous 'A' GS	MAU:WEV	630	Bambous 'A' GS
MAU:PLN	102	Cite Vallijee GS	MAU:PLN	222	S.K. Kanhye GS
<b>Reading</b>			<b>Mathematics</b>		
<b>Region</b>	<b>School ID</b>	<b>School Name</b>	<b>Region</b>	<b>School ID</b>	<b>School Name</b>
MAU:EBB	305	Bon Accueil GS	MAU:PLN	206	Fond du Sac GS
MAU:PLN	109	Raoul Rivet GS	MAU:EBB	616	Andre Glover GS
MAU:WEV	619	Beau Sejour GS	MAU:EBB	608	N.D des Victoires RC
MAU:PLN	118	Labourdonnais GS	MAU:WEV	507	Ecole de Lorette
MAU:SOC	435	Charles Telfair GS	MAU:WEV	514	Pandit Sahadeo GS
MAU:WEV	621	Sir V. Ringadoo GS	MAU:WEV	618	Baichoo Madhoo GS
MAU:WEV	514	Pandit Sahadeo GS	MAU:WEV	504	N.Saddul GS
MAU:WEV	507	Ecole de Lorette	MAU:PLN	118	Labourdonnais GS
MAU:PLN	121	N.D de la Paix RC	MAU:PLN	109	Raoul Rivet GS
MAU:WEV	618	Baichoo Madhoo GS	MAU:WEV	619	Beau Sejour GS
MAU:EBB	357	St Pierre RC	MAU:ROD	702	Oyster Bay GS
MAU:SOC	520	Hugh Otterbarry GS	MAU:EBB	341	Mohunlall Mohit GS
MAU:WEV	516	P.C.K.Aryan Vedic Aided	MAU:SOC	520	Hugh Otterbarry GS
MAU:EBB	341	Mohunlall Mohit GS	MAU:WEV	516	P.C.K.Aryan Vedic Aided
MAU:ROD	702	Oyster Bay GS	MAU:WEV	621	Sir V. Ringadoo GS