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7-9, rue Eugène-Delacroix, 75116 Paris

Gender Equality and Education for All:

Message from SACMEQ Countries

by

Mioko Saito

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Mioko Saito

Abstract

The gender equality on educational conditions as well as educational achievement was investigated using the descriptive analyses. Analyses were based on the Reading and Mathematics test scores and some background information from over 60,000 Grade 6 pupils and some 6,000 Grade 6 teachers collected through two sub-regional studies on educational quality undertaken in 1995 and 2000 (known as SACMEQ I and SACMEQ II).

Results suggested that the Grade 6 girls in SACMEQ school systems were more disadvantaged for the provision of toilets. They were rather more advantaged in terms of socio-economics background, age, extent of repetition, and the level of home interest. In other words, boys were more disadvantaged in terms of the educational condition in most of the school systems. However, boys performed significantly better than girls in Mathematics for five out of 14 school systems. For Reading, girls performed significantly better than boys for four school systems. In five school systems, there were no significant gender differences in the achievement of either of the subjects. In four school systems, girls significantly outperformed boys at least in Reading if not both. In these countries, as far as the upper primary level is concerned, girls were equally talented, if not more. It was hypothesized that there might be a vast amount of girls' talent that would not be capitalized if their participation in the higher level is not comparable to that of boys. Ministries of Education in the Southern and Eastern Africa sub-region have some ways to travel on the gender equality.

Introduction

Education is a basic human right (United Nations, 1968). Despite many governments' commitment to ensure the provision of this fundamental right, still some disadvantaged groups have been falling behind, including girls and women. UNESCO (2003) indicated that some two-thirds of the world's total adult illiterate population were women. The Goal 5 of the Dakar Final Framework emphasized that the attainment of Education for All (EFA) by 2015 would require world's commitment in "eliminating gender disparities in primary and secondary education by 2005, and achieving gender equality in education by 2015, with a focus on ensuring girls' full and equal access to and achievement in basic education of good quality" (UNESCO, 2000).

The gender equality issue in education has been a major concern in many countries for a number of reasons, for example, health and nutrition, economic development, and civic responsibilities (UNESCO, 2003). According to UNESCO's EFA Global Monitoring Report 2003/2004, "gender equality" in education refers to the notion of boys and girls experiencing the same advantages or disadvantages in attending school, receiving teaching methods, curricula, and academic orientation, and producing equal learning achievement and subsequent life opportunities (UNESCO, 2003).

In this article, an attempt is made to investigate whether "gender equality" in terms of school participation, treatment, and achievement has been attained in Southern and Eastern African countries. Specifically answers to the following research questions will be sought:

1. What was the proportion of girls at the Grade 6 level in Southern and Eastern African countries?
2. What were the differences in the socio-economic background of Grade 6 boys and girls in Southern and Eastern African countries?
3. What were the differences in the ages of Grade 6 boys and girls in Southern and Eastern African countries?
4. What were the differences in treatment of Grade 6 boys and girls in Southern and Eastern African countries?
5. What were the differences in the achievement of Grade 6 boys and girls in Southern and Eastern African countries?

Methods

(a) Data Source

Data for this article came from the two major educational research policy projects undertaken by a consortium known as the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ). The first survey took place during the period 1995 and 1998 to collect data on Grade 6 reading literacy achievement. The Ministries of Education involved were Kenya, Malawi, Mauritius, Namibia, Zambia, Zanzibar, and Zimbabwe. Following the first survey, during the period 2000 to 2002, SACMEQ undertook the second survey on Grade 6 pupils' and teachers' literacy and numeracy achievement. The surveys were conducted in Botswana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania (Mainland), Uganda, Zambia, and Tanzania (Zanzibar).

(b) Population and Sampling

The target population for SACMEQ I and SACMEQ II was the same. It was defined as "all pupils at the Grade 6 level during the data collection year at the eighth month of the school year who were attending registered government or non-government schools in the country". The criteria for exclusion from the target population varied from country to country: pupils in non-mainstream schools, schools in war zones, too-small and too expensive to visit, too-isolated and non-accessible schools, schools that participated in a similar study which used the same instruments, etc. Throughout both studies, in no country did the excluded population exceed 4.5 percent except SACMEQ II Zanzibar where the excluded population was 16 percent due to inaccessibility.

In both studies, the sample was selected in two stages. At the first stage of sampling, a probability sample of schools was drawn with a probability proportional to the enrolment on Grade 6. For the school systems that did both SACMEQ studies, the intra-class correlation (Rho) obtained in the SACMEQ I study was used. Otherwise, a Rho of 0.4 was used for the school systems that participated only in SACMEQ II. The accuracy required for all school systems was set at the equivalent of a simple random sample of 400 pupils, which would yield a sampling error of approximately 5 percent for a percentage and approximately 0.10 of a standard deviation for a mean value, with a confidence limit of 95 percent. At the second stage of sampling, a simple random

sample of 20 pupils from all Grade 6 pupils was drawn within each selected school. Any increase over 20 would have resulted in minimal gain in sampling precision for percentages and means.

For SACMEQ I, Malawi and Zambia had a notable discrepancy between the planned sample and the achieved sample (64 percent and 78 percent) respectively. For SACMEQ II, Tanzania (Mainland) and Zambia had less than 80 percent achieved sample while the rest of the participating school systems had between 81 to 98 percent achieved sample. For both SACMEQ studies, the reasons for the discrepancies in the number of schools included inaccessibility due to flood or other unexpected hazards. The discrepancies in the number of pupils were due to absenteeism on the testing day. However, sampling weights were applied in order to adjust for (i) discrepancies between the population at the time of sampling and the data collection; (ii) disproportion among strata, and (iii) differences between the planned and achieved numbers within strata. An analysis using the IIEP JACK (Ross & Leite, 2000) of the sampling errors after the data collection demonstrated that most of the sample designs had satisfied the prior requirements of sampling accuracy (see Table 1).

Table 1: Planned and Achieved Sample, Design Effect, and Effective Sample Size for SACMEQ II

School System	Planned Sample		Achieved Sample		% Achieved		Design Effect		ESS	
	Schools	Pupils	Schools	Pupils	Schools	Pupils	Reading	Math	Reading	Math
BOT	170	3400	170	3322	100	98	5.1	4.9	649	682
KEN	185	3700	185	3299	100	89	10.3	9.3	320	355
LES	180	3600	177	3155	98	88	8.1	9.1	391	346
MAL	140	2800	140	2333	100	83	5.3	3.7	442	621
MAU	159	3180	159	2945	100	93	6.0	5.9	488	487
MOZ	179	3580	176	3177	98	89	4.0	4.2	800	740
NAM	275	5500	275	5048	100	92	6.6	6.2	767	810
SEY	24	1571	24	1484	100	94	0.9	0.9	1603	1602
SOU	185	3700	169	3163	91	85	16.9	13.5	187	232
SWA	170	3400	168	3139	99	92	9.4	8.1	333	389
TAN	185	3700	181	2854	98	77	8.7	6.7	325	423
UGA	164	3280	163	2642	99	81	11.9	14.9	222	176
ZAM	175	3500	173	2611	99	75	7.2	6.0	361	430
ZAN	145	2900	145	2514	100	87	1.1	1.0	2234	2470
SACMEQ	2336	47811	2305	41686	99	87				

Source: SACMEQ Archive (2004)

In South Africa and Uganda, there were noticeable shortfalls for the effective sample size. This was due to the under-estimation of the Rho at the time of sampling (0.4 was used). The actual Rho

values for these countries were about 0.7. If they used a higher Rho value, for example 0.6 as done in Namibia, it would have been possible to achieve the effective sample size closer to 400.

A more detailed explanation of the sampling procedures used has been given in Chapter 2 in each of the SACMEQ II national educational policy reports.

(c) Instruments

To make sure that the tests were fair across participating school systems with potentially different curricula, the official curricula and textbooks of SACMEQ countries were first reviewed in order to guide the construction of the test. The SACMEQ I reading test was based on three sources of information: (i) reading tests used by the International Association for Evaluation of Educational Achievement (IEA) Reading Literacy study; (ii) reading tests developed for the IIEP 1991 Zimbabwe Grade 6 study; and (iii) newly written test items contributed by the National Research Coordinators (NRCs) of the participating countries. For SACMEQ II, a subset of the SACMEQ I reading test was used for pupils and another subset with a small overlap was used for the teachers. For the SACMEQ II mathematics, some items for the pupils were based on the IEA's Third International Mathematics and Science Study (TIMSS) while some items were newly written by the NRCs. A subset of these mathematics items was also used for the teacher test. Overall, there were 144 reading test items and 91 mathematics items.

Three different aspects of reading were examined: narrative prose, expository prose, and documents. For mathematics, three aspects measured were numbers, measurement, and space/data. In each country, prior to the data collection, a committee of reading specialists and Grade 6 reading teachers was formed in order to review each of the test items and establish the sub-set of items considered to be "essential items" to be mastered if the pupils are to be able to undertake a successful programme of study at the Grade 7 level according to the government-approved reading and mathematics curricula.

Using the modern item analysis such as Rasch scaling, it was possible to place all of the test items that were administered to different samples as well as at different time points on a single measure for each subject. In addition, the correlation between the Rasch scores on all test items and each school system's own essential test items for the pupil reading mathematics test in both SACMEQ

projects ranged between 0.98 and 0.99, indicating that the all items scores were as 'fair' as the essential items scores for each country.

In order to ensure the content and construct validity of Reading and Mathematics tests, the proposed skill levels of Reading and Mathematics competency in the original Blueprints were cross-checked against the derived skill levels by undertaking the "skills audit" where each item was revisited in terms of exact skills required to answer correctly. It was found that there was a close match between the proposed and derived skill levels in both Reading and Mathematics competencies.

Results

1. Gender differences in Grade 6 enrolment

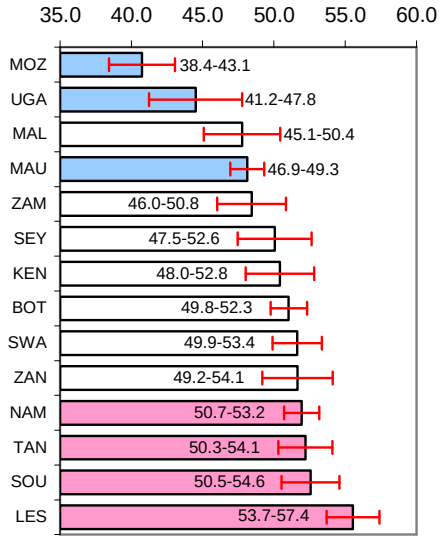
Since the Jomtien Conference of 1990, a significant progress has been made in reducing the gender gap in the area of access to primary schools. As stated in UNESCO's EFA Global Monitoring Report 2003/2004, the ratio of girls' to boys' enrolment worldwide improved from 88 percent to 94 percent between 1990 and 2000 (UNESCO, 2003). Sub-Saharan Africa was one of the three regions where the growth of the enrolment of girls was faster than that of boys. In addition, UNESCO distinguishes 'attendance' from 'enrolment'. It reported that the attendance rates were lower than the enrolment rates in the majority of the African countries. That was for primary schools as a whole. What will be presented here is the proportion of Grade 6 girls and boys during the data collection session. Although the results are not shown, the 'registered enrolment' of Grade 6 boys and girls that was reported by the School Head also showed the same pattern as the attendance.

For each Grade 6 pupil who participated in the SACMEQ data collection session, the gender information has been recorded. In Figure 1, the proportion of girls at the Grade 6 level (in the second column) with the standard error (in the third column) has been presented for each school system in the ascending order. In the bar graph, these proportions with error limits (the values ± twice the standard errors) have been illustrated to indicate that the values for the population would lie within these ranges with 95 percent confidence. For example, in Mozambique, it can be said that with 95 percent confidence, the proportion of girls at the Grade 6 level in the population would range between 38.4 percent and 43.1 percent (i.e., $40.7 \pm 2 \times 1.15$).

From Figure 1, it can be seen that in Mozambique, Uganda, and Mauritius, the upper end of the confidence limit was lower than 50 percent, indicating that with 95 percent confidence there were more boys than girls at the Grade 6 level in school.

Figure 1: Proportion of Girls at the Grade 6 Level in SACMEQ Countries (SACMEQ II)

School System	Proportion of Girls (%)	SE
Mozambique	40.7	1.15
Uganda	44.5	1.63
Malawi	47.8	1.34
Mauritius	48.1	0.60
Zambia	48.4	1.20
Seychelles	50.1	1.30
Kenya	50.4	1.20
Botswana	51.0	0.64
Swaziland	51.6	0.86
Zanzibar	51.7	1.23
Namibia	51.9	0.61
Tanzania	52.2	0.95
South Africa	52.6	1.02
Lesotho	55.6	0.93



Source: SACMEQ Archive (2004)

It should be noted that in Mozambique, Grade 6 is part of the upper primary education, and this level is offered in different school premises from the lower primary level (Grades 1-5). There are also fewer schools for the upper level than the lower level. Although Passos et al. (in progress) urged the Ministry of Education to speed up the structural change of the lower primary education level to cover up to Grade 7, this gender imbalance did not seem to be a feature at the upper level only. As UNESCO (2003) reported, the girls proportion for the lower primary education overall was already as low as 43 percent in 2000. In addition to the structural changes, other cultural, social, and/or physical measures may have to be brought up in order to improve the situation of girls' enrolment. For example, the issue of toilets will be discussed in the later section.

Uganda was another country where the proportion of girls was significantly less than that of boys at Grade 6. Byamugisha & Ssenabulya (in progress) reported that the unrest in certain areas and early marriages are accountable for the lower proportion of girls.

On the other hand, in Lesotho, South Africa, Tanzania, and Namibia, the lower end of the error limit was higher than 50 percent, indicating that with 95 percent confidence there were more girls

than boys at the Grade 6 level in population. For Lesotho and South Africa, boys tend to leave school because they are attracted by early employment in gold mining and livestock tending (Mothibeli & Maema, in progress; Moloi & Strauss, in progress). However, the gender gap in primary school participation has been narrowing since year 2000 as a result of the devaluation of gold and the increased popularity in white-collar jobs, requiring sound basic education.

In Tanzania, Mrutu (in progress) pointed out that at the upper end of the primary education, boys would have very good business opportunities, and therefore boys tend to stay away from schools.

In Namibia, while the reason for higher girls proportion was not explained in the national policy report, it has been suggested that certain regions (such as Ohangwena with 57.5 percent girls at the Grade 6 level) need to undertake special studies in order to investigate the reasons for insufficient boys.

In Malawi, Zambia, Seychelles, Kenya, Botswana, Swaziland, and Zanzibar, the proportion of Grade 6 girls and that of boys who attended school on a particular day were not significantly different. This means that in these school systems, the gender parity has been achieved for the enrolment at the Grade 6 level.

2. Gender differences in the socio-economic background

In general, when pupils are from high socio-economic background, they tend to achieve better than those from low socio-economic background. Where the home is wealthier, the parents can afford more books for their children, provide a room at home for them where they can study in quiet, help with homework, show more interest in their children's school work, and so on.

A SACMEQ socio-economic index was constructed by combining 12 household possession items, both parents' education levels, type of lighting, and the materials used for walls, floors, and roofs. Rather than using a principal component analysis, simple summation of the items was used to construct this index because it showed a better correlation with the overall achievement of the pupils.

As shown in Table 2, in most of the school systems, the differences in the socio-economic level of boys and girls were minimal, i.e., boys and girls were from much the same socio-economic level.

However, the differences were significant in Mozambique, Uganda, and Zambia. In other words, in Mozambique, Uganda, and Zambia, Grade 6 girls came from significantly 'better-off' families than boys. As seen in the results of the Grade 6 enrolment in Figure 1, these countries also had a lower proportion of girls' enrolment than boys. It could be hypothesized that these enrolled 'elite girls' are expected to achieve better than boys, with all other things equal.

Table 2: Socio-economic Background for Grade 6 Boys and Girls in SACMEQ Countries (SACMEQ II)

School System	Socio-Economic Index						
	Boys		Girls		Differences		
	M_B	SE_B	M_G	SE_G	$M_G - M_B$	$SE_{M_G - M_B}$	
Botswana	6.9	0.17	6.9	0.16	0.0	0.23	
Kenya	6.1	0.18	6.2	0.16	0.1	0.24	
Lesotho	5.9	0.12	5.8	0.12	-0.1	0.17	
Malawi	5.1	0.19	5.3	0.19	0.2	0.27	
Mauritius	10.6	0.09	10.6	0.08	0.0	0.12	
Mozambique	5.1	0.11	5.9	0.12	0.9	0.16	**
Namibia	6.3	0.12	6.3	0.12	-0.1	0.17	
Seychelles	11.1	0.07	11.0	0.07	-0.1	0.09	
South Africa	8.5	0.22	8.5	0.24	0.0	0.32	
Swaziland	7.4	0.18	7.5	0.16	0.1	0.24	
Tanzania	5.2	0.20	5.1	0.18	-0.1	0.27	
Uganda	4.5	0.12	5.3	0.18	0.7	0.22	**
Zambia	6.0	0.16	6.6	0.17	0.6	0.24	**
Zanzibar	5.6	0.09	5.5	0.09	-0.1	0.13	

** Gender differences are significant at 95% confidence limit.
Source: SACMEQ Archive (2004)

3. Gender differences in the ages

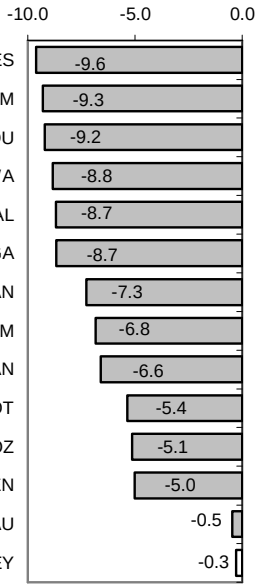
The pupils' ages calculated in month have been presented in Figure 2. In the SACMEQ countries, pupils start schooling at the age of either 6 or 7. If these pupils progressed normally through the system without entering late or repeating a grade, they should be between 132 and 144 months (11 to 12 years) of age. However, the ages of these pupils were 14 to 40 months older than they should have been in all school systems except Mauritius and Seychelles.

In terms of the gender differences, in all school systems except in Mauritius and Seychelles, Grade 6 boys were much older than Grade 6 girls. These differences ranged from less than a month in Mauritius and Seychelles to over nine months in Lesotho, Zambia, and South Africa.

It could be hypothesized that if girls were disadvantaged in schools, then they should have a higher mean age. In fact, it was the opposite; they were advantaged compared to the boys. This means that the boys were either entering the system later than the girls or repeating more than the girls.

Figure 2: Means (M) and Sampling Errors (SE) of the Pupil Age in Months for Grade 6 Boys and Girls in SACMEQ Countries (SACMEQ II)

School System	Pupil Age in Months						
	Boys		Girls		Differences		
	M_B	SE_B	M_G	SE_G	$M_G - M_B$		$SE_{M_G - M_B}$
Lesotho	175.0	1.00	165.4	0.73	-9.6	**	1.24
Zambia	171.2	1.72	161.9	1.20	-9.3	**	2.10
South Africa	161.8	0.92	152.5	0.62	-9.2	**	1.11
Swaziland	171.0	0.78	162.1	0.67	-8.8	**	1.03
Malawi	178.2	1.00	169.5	0.73	-8.7	**	1.24
Uganda	175.3	1.08	166.6	1.09	-8.7	**	1.53
Zanzibar	182.9	0.66	175.6	0.54	-7.3	**	0.85
Namibia	169.9	0.69	163.1	0.66	-6.8	**	0.96
Tanzania	183.9	1.00	177.3	0.85	-6.6	**	1.31
Botswana	160.6	0.49	155.2	0.44	-5.4	**	0.66
Mozambique	178.7	0.66	173.6	0.85	-5.1	**	1.08
Kenya	170.9	0.96	165.9	0.89	-5.0	**	1.31
Mauritius	136.1	0.16	135.6	0.14	-0.5	**	0.21
Seychelles	138.9	0.17	138.6	0.18	-0.3		0.25



** Gender differences are significant at 95% confidence limit.
Source: SACMEQ Archive (2004)

4. Gender differences in treatment

(a) Provision of Toilets

Literatures suggest that certain school obstacles may play a part in the lower participation in girls' schooling and/or lower performance of girls. These could include long distance to travel to schools, long hours of house chores, school violence/harassment, and non-availability of girls' toilets (UNESCO, 2003; ADB, 2006; Oxaal, 1997). Toilets are one of the basic items in the school infrastructure that is indispensable, especially for teen-age girls.

In the SACMEQ II study, data were collected on the number of toilets (including latrines and pit holes). In order to calculate the pupil/toilet ratio for each sex, first the gender ratio at each school was applied to the number of pupils in the biggest shift to find out the number of boys and girls. Then these figures were used to obtain the ratios of girls to girls' toilets and boys to boys' toilets during the biggest shift.

In Table 3 the numbers of boys and girls for each toilet have been presented for each country. It should be noted that in Seychelles and Zanzibar, since this is a school level variable and all schools participated in the study (not a sample), their standard errors have been shown as 0 for this school-level variable.

Table 3: Means (M) and Sampling Errors (SE) of the Toilet Provision for Boys and Girls in SACMEQ Countries (SACMEQ II)

School System	Toilet Provision						
	Boys / Boys' Toilets		Girls / Girls' Toilets		Differences		
	M_B	SE_B	M_G	SE_G	M_G-M_B	SE_{MG-MB}	
Botswana	45.3	2.24	45.0	2.26	-0.3	3.18	
Kenya	45.7	2.50	45.0	2.68	-0.7	3.66	
Lesotho	80.8	9.00	75.9	8.21	-5.0	12.18	
Malawi	135.9	23.33	115.8	8.49	-20.1	24.83	
Mauritius	42.5	1.94	34.9	1.44	-7.6	2.41	**
Mozambique	104.3	7.95	160.6	9.95	56.4	12.74	**
Namibia	85.4	4.85	73.5	4.17	-11.9	6.40	
Seychelles	24.0	0.00	23.4	0.00	-0.6	0.00	**
South Africa	50.5	3.67	47.3	3.62	-3.2	5.16	
Swaziland	96.1	9.62	94.4	10.50	-1.7	14.24	
Tanzania	77.7	7.45	81.7	9.56	4.0	12.12	
Uganda	126.7	10.51	132.6	12.86	5.9	16.60	
Zambia	43.2	3.00	44.9	3.09	1.7	4.30	
Zanzibar	169.9	0.00	166.4	0.00	-3.6	0.00	**

** Gender differences are significant at 95% confidence limit.
Source: SACMEQ Archive (2004)

The ratio of pupils to toilets was over 100 in Malawi, Mozambique, Uganda and Zanzibar for both sexes. It varied from 23 for girls in Seychelles to 169 for boys in Zanzibar. In Mozambique, there were 104 boys for one boy's toilet as opposed to 161 girls for one girl's toilet, which yielded a significant gender difference suggesting that there were significant shortages of girls' toilets in schools. On the other hand, in Mauritius, Seychelles, and Zanzibar, there were significant shortages of boys' toilets.

Regarding toilets, the notion of equality may require differential weights based on the needs. When schools lack separate private toilet facilities for girls, this would probably be a more serious problem than lacking facilities for boys.

(b) Repetition

Repetition could be considered as one of the "treatment" issues because the criteria for deciding pupils to repeat are usually dependent on the classroom teachers. The repeaters are then separated from the cohort. The effect of the repetition on the pupils has been long debated. Typically, the repeating pupils are expected to improve academic standard by spending additional year at the same level. However, there may be a negative effect on pupils' self-esteem and confidence (Eisemon, 1997). In addition, in the planning point of view, repetition is considered as an element of 'wastage' as the repeating pupils attain one year of schooling using more years' worth of resources (IIEP, 2006).

In the SACMEQ II Questionnaire, Grade 6 pupils were asked how many times they had repeated. The percentages of Grade 6 boys and girls who had repeated at least once have been shown in Figure 3. Although automatic promotion is used in Seychelles and Zanzibar, the percentage of repeaters was not zero. In terms of the sex differences, the results were mixed. In Botswana, South Africa, Swaziland, Lesotho, Zanzibar, and Mauritius, more boys than the girls repeated at least once. On the other hand, in Mozambique, more girls than boys repeated at least once.

Combining the results of the age and the repetition, in Mozambique, where boys were significantly older than girls and more girls repeated at least once, it could be hypothesized that the main reason for boys' older age must be late entry.

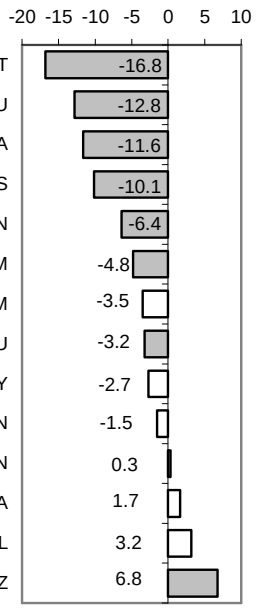
These results were congruent with what was reported in the EFA Global Monitoring Report (UNESCO, 2003), namely, in primary education boys repeated more in Botswana, Mauritius, Zambia, South Africa, Namibia, Swaziland, and Lesotho, and girls repeated more in Tanzania and Mozambique.

The notion of 'disadvantage' may not be obvious in the context of repetition. Kulpoo (1998) reported in the SACMEQ I national report that in Mauritius, quite an important proportion of the top 25 percent achievers had repeated a grade. In Mauritius, parents request teachers so that their

children would repeat a grade because additional learning time is known to contribute to better achievement. If grade repetitions can result in improvement of performance due to longer exposure to instruction, those who repeated more could be actually receiving 'advantageous' treatment'.

Figure 3: Percentages (P) and Sampling Errors (SE) of Grade 6 Boys and Girls Who Have Repeated At Least Once in School Life in SACMEQ Countries (SACMEQ II)

School System	Percentages Repeated At Least Once						
	Boys		Girls		Differences		
	P_B	SE_B	P_G	SE_G	$P_G - P_B$		$SE_{P_G - P_B}$
Botswana	40.0	1.45	23.2	1.14	BOT -16.8	**	1.84
South Africa	49.0	2.27	36.2	2.19	SOU -12.8	**	3.15
Swaziland	65.4	2.01	53.7	1.76	SWA -11.6	**	2.68
Lesotho	66.4	1.92	56.3	1.90	LES -10.1	**	2.71
Zanzibar	30.9	1.56	24.5	1.43	ZAN -6.4	**	2.11
Namibia	56.6	1.37	51.8	1.39	NAM -4.8	**	1.95
Zambia	53.3	1.86	49.8	1.88	ZAM -3.5		2.64
Mauritius	20.3	1.05	17.0	0.94	MAU -3.2	**	1.41
Seychelles	11.7	1.17	9.0	1.02	SEY -2.7		1.55
Kenya	64.9	1.82	63.4	2.04	KEN -1.5		2.73
Tanzania	23.1	2.10	23.4	2.12	TAN 0.3		2.98
Uganda	52.2	2.07	53.8	2.50	UGA 1.7		3.24
Malawi	64.6	2.35	67.8	2.42	MAL 3.2		3.37
Mozambique	75.5	1.31	82.3	1.24	MOZ 6.8	**	1.80



** Gender differences are significant at 95% confidence limit.
Source: SACMEQ Archive (2004)

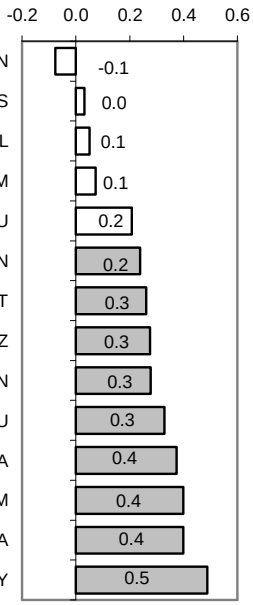
(c) home interests

It is to be expected that the more interest that parents or other family members take in their children's schooling, the more likely it is that the children will learn more. Pupils were asked about the type of involvement that they received from the family members for their study. The questions included whether somebody at home: (1) made sure the home work was done; (2) helped with the homework; (3) asked what pupils were doing at school; (4) asked specific questions on contents; and (5) looked at the work done at school. These questions had varying options: (i) never, (ii) sometimes, and (iii) most of the time. A derived variable was created to combine these five questions into a "home interest composite".

The home interest composite scores and standard errors that Grade 6 boys and girls received at home have been shown in Figure 4. In general, except for Tanzania, girls' families showed more home interest than those of boys. Although the gender differences were very small in all school systems, statistically significant differences were found in Seychelles, Swaziland, Zambia, Uganda, South Africa, Kenya, Mozambique, Botswana, and Zanzibar, indicating that girls received significantly more home interest than boys. No hypotheses have been given in SACMEQ reports to explain this phenomenon. However, in these countries, during the earlier days in the history of schooling, it was the boys who were naturally sent to schools. With the later international commitment, girls' enrolments have been increasing, and there have been a tendency for their parents to be highly educated. Further research is needed in order to test this hypothesis.

Figure 4: Means (M) and Sampling Errors (SE) of the Home Interest Composite for Grade 6 Boys and Girls in SACMEQ Countries (SACMEQ II)

School System	Home Interest Composite (Max: 15)						
	Boys		Girls		Differences		
	M_B	SE_B	M_G	SE_G	$M_G - M_B$		$SE_{M_G - M_B}$
Tanzania	11.6	0.14	11.5	0.15	-0.1		0.20
Lesotho	10.5	0.10	10.5	0.09	0.0		0.14
Malawi	9.0	0.14	9.1	0.14	0.1		0.20
Namibia	10.9	0.07	11.0	0.08	0.1		0.10
Mauritius	11.0	0.11	11.2	0.12	0.2		0.17
Zanzibar	9.5	0.06	9.8	0.06	0.2	**	0.08
Botswana	10.7	0.09	10.9	0.09	0.3	**	0.13
Mozambique	10.8	0.05	11.1	0.06	0.3	**	0.08
Kenya	10.7	0.09	11.0	0.09	0.3	**	0.13
South Africa	11.0	0.10	11.3	0.10	0.3	**	0.14
Uganda	10.3	0.12	10.7	0.12	0.4	**	0.17
Zambia	10.3	0.11	10.7	0.10	0.4	**	0.15
Swaziland	10.0	0.12	10.4	0.09	0.4	**	0.15
Seychelles	11.0	0.07	11.5	0.07	0.5	**	0.10



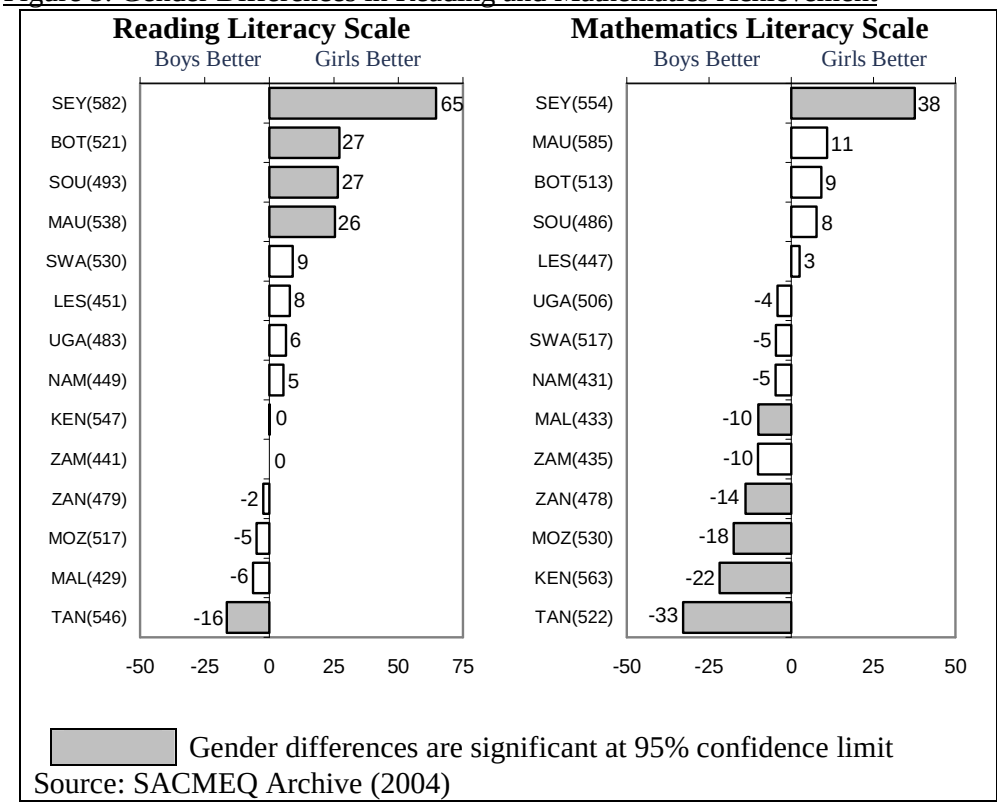
** Gender differences are significant at 95% confidence limit.
Source: SACMEQ Archive (2004)

5. Gender differences in achievement

The differences in average reading and mathematics achievement scores by gender at the Grade 6 level have been presented in Figure 5. The mean test score for each country has been shown on the

left side of each graph. The tests for all the countries in SACMEQ's second study (2000-2002) had a combined mean of 500 and a standard deviation of 100. It is generally accepted that girls tend to do better in Reading and boys tend to do better in Mathematics. However, the SACMEQ results in the gender differences of achievement were mixed.

Figure 5: Gender Differences in Reading and Mathematics Achievement



Source: SACMEQ Archive (2004)

Girls scored significantly higher than boys in Seychelles (+64.7), Botswana (+27.1), South Africa (+26.6), and Mauritius (+25.5) in Reading. In Tanzania, boys scored significantly higher than girls (–16.5). In the other school systems, the differences were not significant. A similar pattern has been identified in the proportion of boys and girls who were in different Reading proficiency levels (see Appendix A).

For Mathematics, only in Seychelles did girls score significantly higher than boys (+37.7). On the other hand, in Tanzania (–32.9), Kenya (–21.8), Mozambique (–17.6), Zanzibar (–14.0), and Malawi (–10.0), boys scored significantly higher than girls. In the other school systems, the differences were not significant. Again, the proficiency levels of Mathematics also dipicts a similar pattern (see Appendix B).

The same four countries, i.e., Seychelles, Botswana, Mauritius, and South Africa, showed significant or slight positive gender differences (favouring girls) in both Reading and Mathematics. It could be hypothesized that in these countries, some positive discrimination measures have been introduced at a very early stage in order to support girls' schooling. Further investigation in the areas of teacher training, textbook development, and community involvement is required.

Discussion and conclusion

In order to help understand the results of achievement, an attempt is made to combine them with the indicators of 'educational conditions' presented before. It should be noted that these indicators do not suggest any causal link on achievement. Other variables that were not reported here may explain the gender differences. However, there are some important messages that emerge from these findings.

For the SACMEQ I study, Saito (1998a, 1998b) and Saito & Kuroda (2000) found no gender differences in the reading achievement of Grade 6 pupils in the sub-region. Rather, the more important differences were the disparities between geographical locations and socio-economic levels. They concluded that the absence of gender differences was not due to the participation of elite girls because at the upper primary level the enrolment level was equal at around 50 percent.

From the SACMEQ II results, this conclusion remained valid for most of the countries. In fact, in Mozambique and Uganda, where fewer girls were enrolled than boys, these enrolled girls could be considered as 'selected elites' with higher socio-economic background than boys. However, in terms of achievement, in Mozambique, while 'selected elite girls' were expected to do well, boys achieved significantly better in Mathematics and they performed slightly better in Reading. Although the classroom treatment showed no gender differences in Mozambique, girls seemed to be disadvantaged in terms of the availability of toilets as well as grade repetition. This calls for further investigation.

On the other hand, 'selected elite boys' were found in Tanzania, where significantly fewer boys were enrolled than girls at the Grade 6 level. In Tanzania, boys tended to stay away from school for better business opportunities (Mrutu, in progress). Moreover, Tanzania was the only country where boys performed significantly better than girls in both subjects.

Particular concern for the disadvantaged boys' has been raised for Seychelles, where girls had higher achievement than boys in both subjects. This was consistent with the results of the Seychelles national examination in all subjects (Leste, in progress). In Seychelles, a practice called 'streaming' takes place where pupils were divided into groups based on their ability, and these different groups would follow different pedagogies. Leste reported that although there were about equal numbers of girls and boys at the Grade 6 level, in the top stream, it was the girls who were the majority, and in the rest of the streams, it was the boys who outnumbered girls, with up to a maximum of 75 percent of a stream in the bottom stream. Leste argued that streaming, which takes place at an early stage, is not solely based on the ability but on other social criteria, which favour girls. An achievement gap between boys and girls would be created over time.

In Lesotho, Namibia, Swaziland, Uganda, and Zambia, there were no gender differences in the achievement of any subject. In addition, in Botswana, Mauritius, Seychelles, and South Africa, girls significantly outperformed boys at least in Reading if not both. In these countries, as far as the upper primary level is concerned, girls were equally (or more) talented. What is more important is the issue of other opportunities in later life, such as access to higher education, employment, and social movement. If in fact the female participation in secondary and tertiary levels was lower than the male participation as exhibited in the EFA Global Monitoring Report (UNESCO, 2003), this could potentially mean that those girls would have less chance of further developing their talent that existed at the end of primary school.

The purpose of this article was to investigate whether "gender equality" had been attained in the Southern and Eastern African countries. The gender equality in terms of the EFA context was investigated through such variables as enrolment, socio-economic level, age, toilet provision, repetition, parent interests, and achievement. In general it was the boys who were disadvantaged in a various aspects in education, but despite this, they achieved better in Mathematics.

Ministries of Education in the Southern and Eastern Africa sub-region have some ways to travel on the gender equality.

References

Asian Development Bank. (2006). *Pursuing Gender Equality through the Millennium Development Goals in Asia and the Pacific*. Manila: ADB.

Byamugisha, A., & Ssenabulya, F. (in progress). The SACMEQ II project in Uganda: A study of the conditions of schooling and the quality of education. Harare: SACMEQ.

Chimombo, J., Kunje, D., Chimuzu, T., & Mchikoma, C. (in progress). The SACMEQ II project in Malawi: A study of the conditions of schooling and the quality of education. Harare: SACMEQ.

Eisemon, T. O. (1997). *Reducing repetition: Issues and strategies*. Fundamentals of Educational Planning, No. 55. Paris: UNESCO-IIEP.

IIEP. (2006). *Module 2: Internal efficiency of an education system*. Self-learning materials on basic quantitative techniques used in educational planning. Paris: UNESCO-IIEP.

Keitheile, M., & Mokubung, M. (in progress). *The SACMEQ II project in Botswana: A study of the conditions of schooling and the quality of education*. Harare: SACMEQ.

Kulpoo, D. (1998). The quality of education: Some policy suggestions based on a survey of schools in Mauritius. Paris: International Institute for Educational Planning.

Kulpoo, D., & Soonarane, M. (in progress). *The SACMEQ II project in Mauritius: A study of the conditions of schooling and the quality of education*. Harare: SACMEQ.

Leste, A., Valentin, J., & Hoareau, F. (in progress). *The SACMEQ II project in Seychelles: A study of the conditions of schooling and the quality of education.* Harare: SACMEQ.

Machingaidze, T., Pfukani, P., & Shumba, S. (1998). The quality of education: Some policy suggestions based on a survey of schools in Zimbabwe. Paris: International Institute for Educational Planning.

Makuwa, D. (in progress). *The SACMEQ II project in Namibia: A study of the conditions of schooling and the quality of education*. Harare: SACMEQ.

Milner, G., Chimombo, J., Banda, T., & Mchikoma, C. (2001). The quality of education: Some policy suggestions based on a survey of schools in Malawi. Paris: International Institute for Educational Planning.

Moloi, M., & Strauss, J. (in progress). *The SACMEQ II project in South Africa: A study of the conditions of schooling and the quality of education.* Harare: SACMEQ.

Mothibeli, A., & Maema, M. (in progress). *The SACMEQ II project in Lesotho: A study of the conditions of schooling and the quality of education*. Harare: SACMEQ.

Mrutu, A., Ponera, G., & Nkumbi, E. (in progress). *The SACMEQ II project in Tanzania: A study of the conditions of schooling and the quality of education*. Harare:SACMEQ.

Nassor, S., & Ali Mohammed, K. (1998). The quality of education: Some policy suggestions based on a survey of schools in Zanzibar. Paris: International Institute for Educational Planning.

Nassor, S., Abdallah, M., Salim, M., & Said, O. (in progress). *The SACMEQ II project in Zanzibar: A study of the conditions of schooling and the quality of education*. Harare: SACMEQ.

Nkamba, M., & Kanyika, J. (1998). The quality of education: Some policy suggestions based on a survey of schools in Zambia. Paris: International Institute for Educational Planning.

Nzomo, J., Kariuki, M., & Guantai, L. (2001). The quality of education: Some policy suggestions based on a survey of schools in Kenya. Paris: International Institute for Educational Planning.

Onsomu, E., Nzomo, J., & Obiero, C. (in progress). *The SACMEQ II project in Kenya: A study of the conditions of schooling and the quality of education*. Harare: SACMEQ.

Oxaal, Z. (1997). *Education and poverty: A gender analysis*. BRIDGE Report No. 53. Brighton: Institute of Development Studies.

Passos, A., Nahara, T., Magaia, F., & Lauchande, C. (in progress). *The SACMEQ II project in Mozambique: A study of the conditions of schooling and the quality of education*. Harare: SACMEQ.

Ross, K., & Leite, S. (2000). *IIEP Jack User's Guide*. Paris: UNESCO-IIEP.

Ross, K., Saito, M., Dolata, S., Ikeda, M., & Zuze, L. (2004). *Data archive for the SACMEQ I and SACMEQ II projects*. Paris: IIEP-UNESCO.

Saito, M. (1998a). Gender vs. socio-economic status and school location differences in Grade 6 Reading Literacy in five African countries. *Studies in educational evaluation, 24(3),* pp. 249-261.

Saito, M. (1998b). The impact of gender, social background, and school location on reading levels in Southern Africa. *IIEP newsletter 16(4).* Paris: UNESCO/IIEP.

Saito, M. (2004). Gender equality in reading and mathematics achievement: Reflecting on EFA goal 5. *IIEP Newsletter 22*(2). Paris: UNESCO/IIEP.

Saito, M., & Kuroda, K. (2000). アフリカ７カ国における初等教育就学児童の読解力の男女間格差に関する統計的考察―教育の質調査のための南アフリカ諸国連合（SACMEQ）の調査結果から。 [Investigation on gender differences in primary school pupils' reading literacy in seven African countries: Results from SACMEQ]. *Journal of International Cooperation in Education, 3(1),* pp. 25-39.

United Nations. (1968). Universal *declaration of human rights*. New York: United Nations.

UNESCO. (2000). *The Dakar framework for action*. ED-2000/WS/27. Paris: UNESCO.

UNESCO. (2003). *EFA Global Monitoring Report 2003/2004: Gender and education for all: the leap to equality*. Paris: UNESCO.

Voigts, F. (1998). *The quality of education: Some policy suggestions based on a survey of schools in Namibia*. Paris: International Institute for Educational Planning.

Zuze, L., Ross, K., & Lee, V. (in progress). HLM Models (3-level decomposition and causal).

Appendix A: Proportion of Grade 6 boys and girls in different Reading proficiency levels

		Reading Levels							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
BOT	Boys	4.5	10.6	19.0	22.5	20.4	11.7	8.1	3.1
	Girls	1.2	4.8	12.5	23.5	27.7	16.3	10.8	3.2
KEN	Boys	1.2	4.8	11.7	20.1	23.2	19.3	14.8	5.0
	Girls	0.9	4.4	9.9	20.8	27.4	19.1	12.4	5.1
LES	Boys	6.1	27.0	33.7	23.0	6.0	2.6	1.4	0.2
	Girls	5.1	21.2	33.9	25.1	10.8	2.4	1.2	0.3
MAL	Boys	11.4	31.1	33.1	17.3	5.3	1.6	0.3	0.0
	Girls	11.2	35.4	34.2	15.0	3.4	0.7	0.1	0.0
MAU	Boys	7.7	15.0	16.5	12.8	13.3	11.1	13.9	9.7
	Girls	5.4	9.0	10.7	16.4	16.1	13.2	18.3	10.9
MOZ	Boys	2.4	3.6	11.8	27.6	32.3	16.4	5.8	0.2
	Girls	2.0	4.4	10.5	30.6	33.3	15.7	3.7	0.0
NAM	Boys	13.3	31.8	26.7	13.3	5.5	3.4	3.9	2.0
	Girls	12.4	29.5	26.4	15.3	6.4	3.7	3.9	2.4
SEY	Boys	4.6	10.5	12.2	15.9	13.6	14.9	16.8	11.4
	Girls	1.3	4.2	5.4	9.7	15.6	15.1	26.7	22.0
SOU	Boys	13.6	20.2	20.3	17.3	9.1	6.0	8.5	5.1
	Girls	10.9	17.6	18.1	14.8	9.7	7.9	13.1	7.9
SWA	Boys	0.5	2.0	12.4	31.8	31.2	14.4	6.0	1.8
	Girls	0.1	1.4	9.6	31.6	31.5	16.2	7.7	1.9
TAN	Boys	2.1	5.4	8.8	17.6	20.1	20.7	21.9	3.4
	Girls	3.4	5.6	9.9	20.0	22.6	20.5	16.0	2.1
UGA	Boys	7.0	17.9	23.4	22.2	14.1	7.8	5.7	1.8
	Girls	7.5	18.7	19.8	20.6	15.7	8.5	4.9	4.3
ZAM	Boys	19.4	27.1	21.2	16.1	7.5	4.8	3.2	0.6
	Girls	20.3	28.5	20.6	12.2	8.3	6.4	2.6	1.2
ZAN	Boys	5.6	14.9	21.3	25.0	21.7	8.9	2.6	0.0
	Girls	6.5	12.7	21.6	28.8	19.4	9.8	1.3	0.0

Appendix B: Proportion of Grade 6 boys and girls in different Mathematics proficiency levels

		Mathematics Levels							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
BOT	Boys	3.6	28.8	33.9	19.2	9.5	3.8	1.1	0.1
	Girls	3.1	22.9	37.7	20.0	10.8	3.8	1.4	0.4
KEN	Boys	0.1	8.4	28.9	24.6	19.6	12.7	3.9	1.8
	Girls	1.0	11.8	32.3	26.9	16.4	8.1	2.7	0.7
LES	Boys	9.1	56.6	27.1	5.8	0.9	0.4	0.1	0.0
	Girls	8.1	57.9	26.5	6.0	1.1	0.3	0.2	0.0
MAL	Boys	11.2	58.6	27.3	2.8	0.2	0.0	0.0	0.0
	Girls	13.7	65.4	19.5	1.3	0.2	0.0	0.0	0.0
MAU	Boys	2.7	20.3	22.2	16.4	10.2	10.9	9.9	7.3
	Girls	2.1	15.9	21.4	17.0	14.4	11.6	11.0	6.7
MOZ	Boys	0.4	10.5	39.3	33.3	14.3	2.2	0.1	0.0
	Girls	0.5	15.7	45.3	30.4	7.1	0.9	0.1	0.0
NAM	Boys	19.5	55.8	15.3	3.6	2.4	2.5	0.8	0.1
	Girls	19.9	58.1	14.4	3.5	1.7	1.7	0.7	0.2
SEY	Boys	3.0	25.3	27.8	18.4	10.5	9.9	3.8	1.4
	Girls	2.2	14.7	20.5	21.0	17.0	16.7	6.3	1.6
SOU	Boys	8.2	44.7	25.0	8.5	4.9	5.6	2.0	1.1
	Girls	7.6	44.1	22.7	9.0	7.1	5.9	2.1	1.5
SWA	Boys	0.7	18.1	46.8	22.4	8.6	2.4	0.7	0.2
	Girls	0.9	24.2	42.0	21.2	8.5	2.3	0.6	0.3
TAN	Boys	2.2	18.2	32.0	22.9	12.0	8.8	3.1	0.7
	Girls	3.4	26.8	37.7	20.1	8.0	3.8	0.3	0.1
UGA	Boys	4.5	31.8	34.1	13.2	6.6	4.6	4.3	0.8
	Girls	6.6	35.3	28.6	11.1	5.4	6.5	6.2	0.3
ZAM	Boys	15.9	51.6	23.7	5.8	2.6	0.3	0.1	0.0
	Girls	17.7	57.3	19.2	4.1	1.0	0.6	0.0	0.1
ZAN	Boys	2.2	38.1	41.8	12.0	4.8	0.9	0.2	0.0
	Girls	3.8	43.8	40.5	8.1	2.7	1.1	0.0	0.0