Learning Environment and Mathematics Achievement: A Comparative Analysis of the Situation Across the Fourteen SACMEQ Countries

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In this paper, comparative analyses of pupils' mathematics achievement were performed. Data analyzed consisted of about 42,000 pupils from 14 countries. The focus of the study was on learning environment and mathematics achievement in which variables such as class size, school location, classroom resources and whether or not pupils take extra tuition were analyzed and compared to pupils' mathematics achievement across the countries that participated in the study. Mixed results were found on almost all variables explored. The only consistent finding across the countries was that pupils attending urban schools performed higher than those attending rural schools. Generally, pupils exhibited low achievement in mathematics; it is only in two countries where pupils obtained slightly over fifty percent of the total score. Gender differences in favor of girls were found in five out of 14 countries but the highest difference was in favor of girls. It is concluded that mathematics achievement is a complex phenomenon as many variables seem to affect it. Consequently, improving mathematics achievement would entail addressing these multiple factors simultaneously.

Introduction

In an age of globalization and economic competition, large scale comparative studies have increasingly gained popularity all over the world. This popularity reflects the legitimate needs of decision-makers and politicians to obtain comparative data on the scholastic achievement of their pupils and to have some measures of efficiency of their national educational systems. The Southern and Eastern Africa Consortium for Monitoring

Educational Quality (SACMEQ) is one of such initiatives. SACMEQ has generated relevant information that can be used by decision-makers to plan improvements in their education systems through major research projects popularly known as SACMEQ I and SACMEQ II. In this paper, comparative analyses of mathematics achievement across various African countries that participated in the were performed with the aim of providing information that may help both academics and decision-makers to understand important educational issues that have significant policy implications. The paper is confined to analysis of mathematics achievement and selected variables from SACMEQ II.

The rationale for analyzing mathematics achievement stems from the perceived role of mathematics in promoting economic development. Mathematics is considered a crucial subject for advancement of science and technology. It is also a key subject that provides relevant foundation to many other subjects such as science, economics and business. The relevance of mathematics has made many countries like Tanzania to make mathematics a compulsory subject in primary and secondary schools (Ministry of Education and Culture, 1995). Despite the emphasis placed on mathematics, pupils' achievement on the subject has been unsatisfactory and has attracted research interest for many years. It is not a mere coincidence that in SACMEQ II study, pupils' achievement in mathematics was measured along with other variables.

This paper focuses on learning environment and mathematics achievement. Learning environment has been conceived in a broad context to include variables such as school and classroom resources, class size, availability of textbooks and location of school.

This paper attempts to contribute to the literature on mathematical achievement and factors affecting it. The paper attempts to answer the following research questions:

1. What are the levels of mathematics achievement across the nationals and whether there are significant differences in mathematics achievement of boys and girls?
2. What are the school context factors that were experienced by grade 6 mathematics pupils across the 14 SACMEC countries?

Data sources

Data for this study were obtained from the SACMEQ Data Archive (Ross, Saito, Dolata, Ikeda & Zuze, 2004). SACMEQ II project covered 2,300 schools, 5,300 teachers and 42,000 pupils in 14 countries. The countries involved include Botswana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Zambia and Tanzania (both the Mainland and Zanzibar). Mathematics tests for both teachers and pupils were constructed to measure three different domains of mathematics as hereby described.

Numbers: This domain included operations and number line, square roots, rounding and place value, significant figures, fractions, percentages and ratios.

Measurement: This domain included measurement related to distance, length, area, capacity, money and time.

Space-Data: This domain included geometric shapes, charts and tables of data.

The distribution of items across the three main mathematical domains is shown in Table 1.

Insert Table 1 about here

Table 1 shows that the domain of numbers was accorded the highest weight of 42.9 percent, followed by measurement which comprised of 34.9 percent of total test items while the least weight, 22.2 percent was accorded to space-data domain. The weighting of different content areas reflects the general emphasis placed in primary school mathematics curriculum of the 14 SACMEQ countries. The pupils' mathematics test consisted of 63 multiple choice items from three main content areas namely; Number, Measurement, Space/Data. However, three item were excluded from the final analyses because they failed a Rasch "differential item functioning" across three groups: SACMEQ I Pupils, SACMEQ II Pupils and SACMEQ II teachers (Ross, et. al., 2004)

The target population for the study was defined as *"All pupils at Grade 6 level in 2000 (at the first week of the eighth month of the school year) who were attending registered mainstream primary schools*". Grade 6 pupils were considered to have acquired basic knowledge and skills that would have enabled them to participate meaningfully in the study. Detailed sampling procedure used in SACMEQ II can be found in IIEP (n.d) document in the Chapter 2 that is devoted to the methodology of the study.

Data analysis procedure

Descriptive statistics were used mainly to establish the context under which learning of mathematics was conducted. Specific variables investigated include availability of school and classroom resources, class size, school location, provision of extra tuition, frequency at which pupils are given homework and whether or not it is corrected. Mathematics achievement was analyzed through focusing on the overall scores as well as scores on each of the three main domains. Correlations were computed to explore relationship between pupils' mathematics achievement and selected learning environment variables. Independent sample t-tests were performed to establish whether or not there were statistically significant differences between mathematics achievement of boys and girls.

Levels of mathematics achievement

Initially, mathematics achievement was described under five main levels. However the results of the Rasch analyses, conducted by compilers of SACMEQ II data, provided a means of assessing whether the levels proposed in the test blueprints were congruent with a detailed examination of the actual test items located at different difficulty levels along the dimensions that had been generated. A total of eight levels were finally generated and are presented in a hierarchy of higher order thinking skills required. These eight levels were named: Pre Numeracy, Emergent Numeracy, Basic Numeracy, Beginning Numeracy, Competent Numeracy, Mathematically Skilled, Concrete Problem Solving and Abstract Problem Solving.

Overall mathematics achievement across 14 countries

In order to provide an overview of pupils' achievement in mathematics, the percentage of total correct score for each pupil was computed. The mean and standard deviation of the percentage correct scores were computed for each country. Pupils' levels of mathematics achievement were also examined and a mean score of mathematics level attained by pupils in each country was computed. Table 2 presents mean percent correct score in mathematics and mean level of mathematics achievement per country.

Insert Table 2 about here

Overall performance across the countries indicates that generally pupils did not perform well in Mathematics. Only in two countries, Mauritius (52.7 percent) and Kenya

(51.0 percent), pupils obtained a mean percent correct score of slightly above fifty. Pupils in six countries, Botswana, Mozambique, Swaziland, Seychelles, Tanzania, and Uganda obtained mean percent correct scores ranging from 40 to 49. In the remaining countries, pupils scored below 40 percent, the lowest percent correct score being 29.2 that was attained by Malawi and Zambia pupils.

In terms of levels of mathematics, only pupils in three countries – Mauritius, Kenya and Seychelles – attained an average of Level 4 of mathematics competence, that is Beginning Numeracy. The lowest mean level of mathematics competence was Level 2, Emergent Numeracy, that was attained by Malawi, Zambia, Namibia Lesotho. The remaining countries were at the average of Level 3 of mathematics achievement. Since the mean score provides a general overview of pupils' level of mathematics achievement in a country, percentage of pupils, Figure 1 presents percentages of pupils attaining selected levels of mathematics achievement, that is Level 1- 2, Level 3-4 and Level 7-8 so as to indicate how the pupils are distributed along the eight levels of mathematics achievement.

Insert Figure 1 about here

Data presented in Figure 1 show that in seven countries, majority pupils' mathematical levels ranged from Level 1 to Level 2 while in the remaining seven countries the level of mathematics achievement for majority of pupils fell in Level 3 to Level 4. Only one country, Mauritius, had a high percentage of pupils (16.4 percent) attaining at Level 7 or Level 8. Other countries with about five to six percent of pupils attaining Level 7 or Level 8 of mathematics include Seychelles, Uganda and Kenya. In Malawi, none of the pupils who participated in SACMEQ II study attained a mathematics score beyond Level 6 while in

Zanzibar, Zambia and Mozambique, the percentage of pupils attaining Level 7 or Level 8 of mathematics competence ranged from 0.1 to 0.2 percent, a very negligible percentage. In general, the overall mathematics achievement and analysis of levels of mathematics achievement attained indicate that pupils did not perform well.

Gender differences in mathematics achievement

This paper sought to explore gender differences in mathematics across the 14 SACMEQ countries. The achievement of boys and girls was examined in relation to their overall performance on mathematics. A t-test was performed to establish whether or not there were statistically significant differences between achievement of boys and girls in mathematics. Table 3 presents the results.

Insert Table 3 about here

With the exception of Lesotho and Swaziland, statistically significant differences between achievement of boys and girls were found in the remaining 12 countries of which five showed differences in favor of girls while seven countries showed differences in favor of boys. The magnitude of the difference between boys and girls achievement ranged from 0.12 to 3.85 with the highest difference (3.85) in Seychelles where girls performed higher than boys.

To further elaborate the extent of gender differences in mathematics achievement, Figure 2 illustrates the differences.

Insert Figure 2 about here

Figure 2 shows that Tanzania has the highest gender difference in mathematics achievement in favor of boys since negative numbers show gender differences in favor of boys. Only five countries, Seychelles, Mauritius, Botswana, South Africa and Lesotho showed gender differences in mathematics achievement in favor of girls. However the difference in mathematics achievement for boys and girls in Lesotho was not statistically significant.

The highest difference between performance of boys and girls in Seychelles is worth noting and certainly further investigation is needed to reveal factors associated with such a desirable excellent performance of girls while in many of the remaining countries girls are not doing excelling in mathematics.

School context factors

Attempts were made to analyze the school context variables with the aim of determining factors that account for differences in mathematics achievement. Both theory and evidence suggest that pupils' knowledge and behavior including academic outcomes are influenced by the characteristics of schools they attend (Shiel & Kelly, 2001). SACMEQ II study has compiled a number of variables on schools and teachers such as qualification and experience of teachers, availability of teaching and learning materials, class size, school location and availability of textbooks. Such variables made it possible to examine the relationship between achievement and school related variables. In this paper, analyses of class size, school and classroom resource indexes were made.

Class sizes and mathematics achievement

In this paper, classes were categorized into three groups according to the number of pupils. The first group comprised of small classes with up to 30 pupils, the second group comprised of medium size classes with 31-45 pupils and the third group consisted of large classes with more than 45 pupils. The third group was considered “large class” since in most countries the Ministry of Education standard for pupils in one class is not more than 45. Percentages of pupils in classes of various sizes were computed and are presented in Table 4.

Insert Table 4 about here

Table 4 shows that all of the pupils in Botswana and Seychelles were attending either small or medium size classes while in Mozambique, majority of pupils (74 percent) were attending large classes. Other countries with a large number of pupils learning mathematics in large classes include Malawi (58.1 percent), Zanzibar (46.3 percent) and Lesotho (42.6 percent). A quick perusal of mean percent correct scores for each country and class size does not seem to reveal a clear pattern that would enable one to explain mathematics achievement based on class size. Correlations were computed to establish the nature and magnitude of relationship between class size and mathematics achievement. Generally, low to moderate correlations between class size and mathematics achievement were found. Six countries portrayed negative correlations of which five were close to zero correlations and one for Namibia reflected a low but statistically significant relationship ($r = -.216$). The remaining eight countries had positive correlations although most of them were close to zero correlations. Positive correlation between class size and mathematics achievement implies that the higher the class size the greater the pupils’ achievement in mathematics. This would then imply that in order to raise achievement in mathematics, one would need to increase number of pupils in classrooms. Obviously, such results seem to contradict the conventional expectation of educators that pupils in small class sizes are expected to perform better than their counterparts in large classes. Nevertheless, the magnitudes of correlations were generally low indicating that only a small proportion of variation in pupils' achievement in mathematics can be attributed to class size.

To further explore the relationship between class size and mathematics achievement, mean scores by class sizes were computed for the transformed mathematics scores. Mean scores for some countries showed higher achievement for pupils in large classes as opposed to their counterparts in small classes. This situation was quite alarming in Mauritius where pupils in small mathematics classes (up to 30 pupils) obtained a mean of 531 while those in large classes (more than 45 pupils) obtained a mean of 657 implying a difference of 126 points. Mathematics scores of pupils in Zambia and Tanzania indicate relatively high mean for pupils in large classes as opposed to their counterparts in small classes, 422 vs. 443 and 507 vs. 524 respectively. On the other hand, results of pupils' mathematics achievement in South Africa and Namibia show that pupils in small classes tend to have high mean scores as opposed to their counterparts in large classes, 517 vs. 458 and 458 vs. 406 respectively.

Achievement differences between rural and urban schools

School location is one of the variables affecting learning achievement. In SACMEQ II, school heads were asked to indicate whether their schools were located in an isolated area, a rural area, a small town or a large city. For the purpose of analysis, the schools located in isolated and rural areas were clustered together and are referred to as rural schools while those located to small town or large city are referred to as urban schools. Pupils' mathematics achievement was compared using the location of school. Figure 3 shows mean scores for school located in urban versus those located in rural areas.

Insert Figure 3 about here

Consistently, in all SACMEQ II countries, pupils in schools located in urban areas performed better than those located in rural areas. The magnitude of the difference varied from country to country with the highest difference being in Namibia. As observed by Saito (1998), in African countries, people with high socio-economic status tend to live in urban areas where schools are better equipped and teachers prefer to live. While home background is considered as one of the key variables in explaining differences in mathematics achievement, pupils are not only affected by socioeconomic circumstances of their parents but also of their peers. That means, in urban where majority of people with socio-economic status tend to live, pupils attending urban schools have the likelihood of being surrounded by positive peer influences and role models. However, in most cases, pupils in schools located in rural areas are generally from parents of low socio-economic factors and tend to experience unfavorable learning environment, thereby being doubly disadvantaged.

Data analysis revealed that the distribution of schools by location was unequal in the SACMEQ study. For instance, Seychelles had only 16 percent of pupils attending schools located in rural areas while in Tanzania, Uganda, Zanzibar, Swaziland and Malawi pupils attending schools located in rural areas ranged from 71 to 77 percent. Thus, differences in mathematics achievement are partly influenced by the proportion urban versus rural schools that were involved in the study.

Homework and mathematics achievement

The study also explored the frequency at which pupils were given mathematics homework and whether or not the homework given was being corrected. Figure 4 presents percentages of frequency at which pupils were given mathematics homework.

Insert Figure 4 about here

Figure 4 shows that a large percentage of pupils in Mauritius indicated that they were given homework most days. This high percentage of homework provision was followed by that of pupils in Namibia and Kenya. In Tanzania, about 50 percent of pupils indicated that they were given homework most days while about 15 percent indicated that they were not given homework at all.

The effectiveness of homework in enhancing learning depends very much on feedback given to pupils about their work. This study explored whether or not pupils' mathematics homework were being corrected. Pupils were asked to select one of the five options namely, I do not get mathematics homework, my teacher never corrects my mathematics homework, my teacher sometimes corrects my mathematics homework, and my teacher always corrects my mathematics homework. For the purpose of this analysis, pupils who indicated that they do not get any mathematics homework were removed and the percentage of the frequency at which mathematics homework is being corrected was computed based on the total number of pupils who selected one of the four remaining options. Findings are presented in Figure5.

Insert Figure 5 about here

Tanzania and Zanzibar consisted of more than 10 percent of pupils indicating that their homework is never corrected while Mauritius, Seychelles and Swaziland consisted of large percentage of pupils (77.9, 69.4 and 65.7 percents respectively) indicating that their mathematics homework is always corrected.

Taking extra tuition and mathematics achievement

The study explored the current practice where in many schools pupils take extra tuition. Thus pupils were asked to indicate whether or not they take extra tuition and were further asked whether or not they have to pay for the extra tuition. Figure 6 shows percentage of pupils taking extra tuition versus those who do not take extra tuition.

Insert Figure 6 about here

Figure 6 shows interesting results in a sense that the two countries that emerged on top in terms of pupils' achievement, Mauritius and Kenya, had a high percentage of pupils taking extra tuition. A question that emerges here is that do those pupils who take extra tuition are the ones who perform well in mathematics? In other words, does high achievement in mathematics associated with taking extra tuition? To answer these questions, the mean scores for pupils taking extra tuition in mathematics were computed and compared. Again interesting findings were obtained. In Mauritius, pupils taking no extra tuition performed less than those taking tuition, mean score of 475 vs. 595 while in Kenya pupils who are not taking extra tuition performed better than those taking extra tuition, mean score of 571 vs. 565. Figure 7 shows difference in mathematics achievement for pupils taking extra tuition and those not taking extra tuition.

Insert Figure 7 about here

Countries like Mauritius and Tanzania showed large differences in mathematics achievement in a manner that pupils taking extra tuition outperformed those not taking extra tuition. The differences were statistically significant at 95 percent confidence interval. In contrast, South Africa, Namibia and Uganda showed significant differences in favor of pupils not taking extra tuition.

Availability of resources and mathematics achievement

Classroom environment was measured through availability of selected eight classroom resources namely a usable writing board, chalk, a wall chart of any kind, a cupboard, one or more bookshelves, a classroom library or book corner, a teacher table and a teacher chair. Mathematics teachers were asked to indicate whether or not their classrooms possessed the mentioned facilities. Mathematics classroom resource index was obtained by taking the sum of facilities available for each class.

School learning environment was measured by asking school heads to indicate availability of selected 22 resources that were grouped in four main categories: school buildings (school library, school hall, staff room, school head's office, storeroom and cafeteria); school grounds (playground and school garden); general services (piped water/well or bore-hole, electricity and telephone) and equipment (first aid kit, fax machine, typewriter, duplicator, radio, tape recorder, overhead projector, television set, video-cassette recorder, photocopier and computer). Table 5 presents the mean availability of classroom and school resources for the 14 SACMEQ countries.

Insert Table 5 about here

As shown in Table 5 Seychelles had the highest mean available resources for both the classrooms (7.0) and schools (16.7). Although Kenya showed an overall high achievement of pupils in mathematics, mean average classroom and school resources were not high (4.5 out of 8 and 8 out of 22 respectively). Correlations between mathematics achievement and classroom resources as well as school resources were computed. In some countries, there was a moderate correlation between school resources and mathematics achievement. Relatively, there were higher correlations between mathematics achievement and school resources than those with classroom resources. Probably this is the case because school resources were many and possession of most of the items listed would imply a school is in good condition. In fact, facilities such as libraries are included in a list of school facilities. Thus, a school containing a well stocked library is likely to encourage pupils to study as opposed to a classroom with a cupboard but no textbooks.

Conclusions and Recommendations

This section presents conclusions and recommendations based on the findings of the study. Given a variety of variables the conclusions and recommendations are organized based on the analyses conducted.

Overall Pupils Mathematics Achievement.

Findings of this study revealed that pupils had low levels of achievement in mathematics. Many pupils were at the levels of Pre Numeracy, Emergent Numeracy and Basic Numeracy. It is evident from this study that students have difficulties in performing tasks requiring higher levels of mathematical thinking such as Concrete Problem Solving and Abstract Problem Solving. This finding has a major implication in terms of how mathematics curricula are designed and implemented. There is a need to ensure that the curriculum used offers pupils with opportunities to learn mathematics beyond simple calculation.

Gender differences in mathematics achievement

Mixed results were found on gender differences with five countries showing high achievement in favor of girls and the remaining nine countries showing high performance in favor of boys. Although the largest difference in achievement of boys and girls was found in favor of girls, the findings of this study generally concur with findings found in international and national studies where in most cases boys tend to perform better in mathematics better than girls. This means researchers and educational planner have still a long way to go in ensuring that girls can equally perform well as boys. It could be interesting to explore factors that have led girls in Seychelles to excel in mathematics so that this successfully attribute could be emulated to other countries.

School context variables

Class size. Class size is one of the key aspects in ensuring quality education. Although findings of this study indicated that in some cases pupils in large classes tended to perform higher than their counterparts in small class, a number of intervening variables could possibly lead to such findings. It is likely that in some areas where the class sizes are large, people in the surrounding area take education related issues seriously. Small class sizes may, in some cases, reflect lack of awareness on the importance of education for people surrounding schools, hence pupils with school age are not all enrolled to school as desireble. Certainly, more sophisticated analyses are needed to tease out the relationship between class size and mathematics achievement.

School resources. School and classroom resources also seem to have influence on pupils' performance. In this study, school resources seemed to be more influential than classroom resources. This observation could be attributed to the type of classroom resources selected. In African countries where educational resources are merger, teachers have learnt to cope with the situation by using alternative resources available locally. The findings tend to suggest that educational planners need to ensure that the school environment is attractive and that basic educational resources are available so as to enhance learning achievement.

Provision of homework. The role of feedback in enhancing learning is widely acknowledged. This seems to be the case also in this study for some countries like Mauritius and Seychelles where students showed high pupils achievement in mathematics. A large proportion of pupils indicated that they are provided homework and it is always marked. However, mixed pattern emerged in terms of the impact of homework to the extent that there is a need for an extensive study to explore the impact of homework on pupils learning.

The only consistent result found in this study was that pupils in urban schools perform better than those in rural schools. Here the influence of parents' socioeconomic status potentially contributes to variations in achievement between rural and urban schools. The challenge for policy makers and educational planners is to ensure equitable distribution of resources in schools so as to minimize potential differences in learning outcomes that can be attributed to the socio-economic status of parents.

In case of tuition, again mixed findings were obtained. While in some countries pupils attending tuition performed better, in others it was vice versa. It would be more informative for one to conduct a study to explore the nature of extra tuition in terms of scope and coverage. How tuition is organized and what are the average class sizes? What are the implications of extra tuition on teachers' performance of regular duties?

This study was mainly descriptive in nature and did not attempt to establish causal-effects relationships. Nevertheless, analyses conducted have illuminated issues that would enable policy makers to realize that mathematics achievement is a complex phenomenon as many variables seem to affect it. Consequently, improving mathematics achievement would entail addressing these multiple factors simultaneously. Otherwise, if one aspect is improved in isolation of others, the impact of such intervention may not be realized.

References

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Table 1: Distribution of mathematics items by content area

Content Area	No. of Items	Percentage of all Items
Numbers	27	42.9
Measurement	22	34.9
Space/Data	14	22.1
Total	**63**	**100.0**

Table 2: Mean percent correct and mean level of mathematics achievement

Country	**N**	**Percent Math Correct**		**Pupil math level**	
		Mean	**S.D**	**Mean**	**S.D**
Botswana	3321	42.4	13.3	3.3	1.2
Kenya	3296	51.0	14.6	4.1	1.3
Lesotho	3144	31.7	9.0	2.4	0.8
Malawi	2323	29.7	7.8	2.2	0.7
Mauritius	2870	52.7	20.5	4.2	1.9
Mozambique	3136	44.2	9.7	3.4	0.9
Namibia	4990	30.9	13.1	2.3	1.1
Seychelles	1482	49.2	17.2	3.9	1.6
South Africa	3135	36.3	16.3	2.8	1.5
Swaziland	3138	43.0	11.0	3.3	1.0
Tanzania	2849	43.2	13.6	3.3	1.3
Uganda	2619	41.0	16.6	3.2	1.5
Zambia	2590	29.7	10.1	2.2	0.9
Zanzibar	2459	36.4	9.9	2.7	0.9

Table 3 Gender differences in mathematics achievement

Country	$\overline{X}_{B}$	$\overline{X}_{G}$	**t**	**p-value**	$\overline{X}_{B} - \overline{X}_{G}$
Tanzania	27.43	24.54	9.61	0.000	2.9
Botswana	25.03	25.87	-3.04	0.002	-0.84
Kenya	31.55	29.64	6.25	0.000	1.91
Lesotho	19.05	19.17	-0.61	0.541	-0.12
Malawi	18.33	17.30	5.27	0.000	1.02
Mauritius	31.10	32.22	-2.46	0.014	-1.13
Mozambique	27.20	25.38	8.59	0.000	1.82
Namibia	18.86	18.24	2.76	0.006	0.62
Seychelles	27.60	31.45	-7.26	0.000	-3.85
South Africa	21.74	22.57	-2.37	0.018	-0.83
Swaziland	25.98	25.67	1.31	0.189	0.31
Uganda	25.06	24.01	2.67	0.007	1.05
Zambia	18.19	17.50	2.86	0.004	0.69
Zanzibar	22.47	21.20	5.30	0.000	1.27

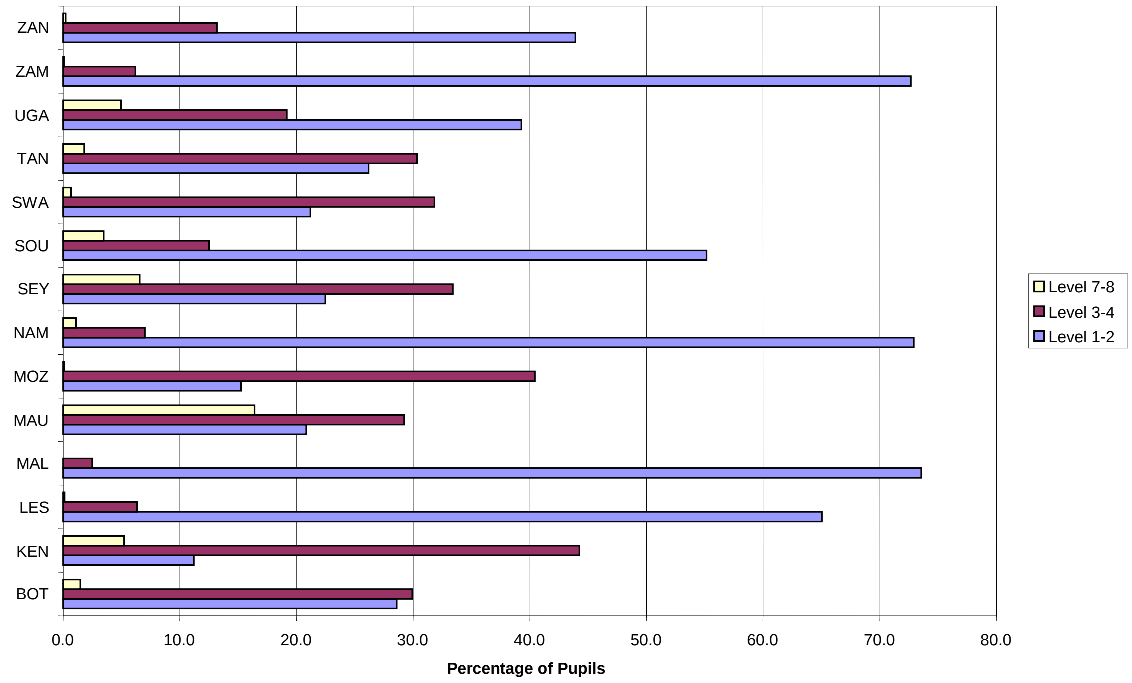
Table 4: Percentage of pupils by size of mathematics class size they attend

Country		Percentage of Pupils	
	Small (1-30)	Medium (31-45)	Large (above 45)
BOT	54.1	45.9	0.0
KEN	27.9	47.6	24.5
LES	25.9	31.5	42.6
MAL	18.1	23.8	58.1
MAU	28.0	61.9	10.1
MOZ	4.7	21.3	74.0
NAM	26.9	57.7	15.3
SEY	66.6	33.4	0.0
SOU	17.4	50.4	32.2
SWA	28.7	57.9	13.4
TAN	25.3	48.1	26.6
UGA	21.2	54.4	24.4
ZAM	41.8	40.7	17.5
ZAN	11.1	42.6	46.3

Table 5: Mean availability of classroom and school resources by country

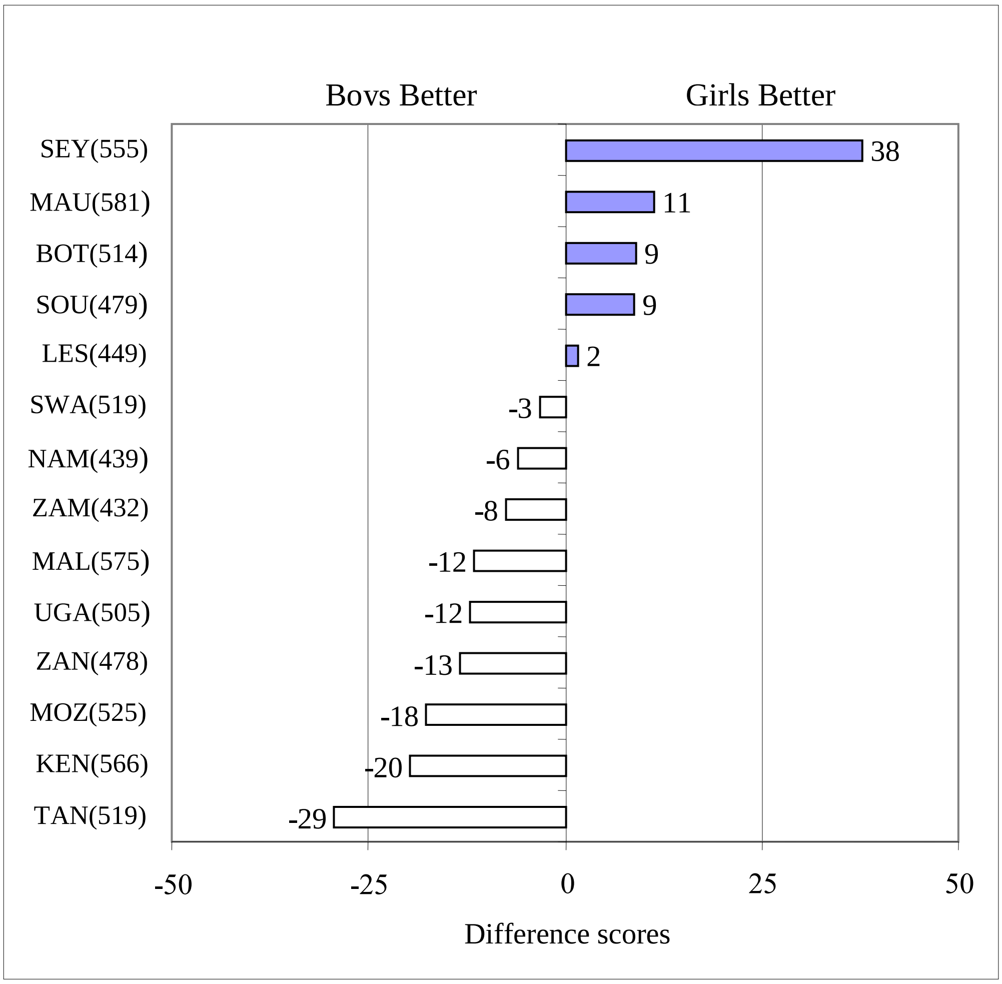
Country	Math class resources (Max=8)		School Resources (Max = 22)	
	Mean	**S.D**	**Mean**	**S.D**
BOT	6.4	1.8	9.8	3.3
KEN	4.5	1.9	8.0	3.5
LES	6.2	1.5	6.3	2.2
MAL	4.4	1.7	4.2	2.0
MAU	6.1	2.3	14.4	2.1
MOZ	4.1	1.4	6.7	3.8
NAM	5.5	1.9	11.2	5.9
SEY	7.0	2.0	16.7	1.4
SOU	6.0	1.7	11.6	6.4
SWA	5.8	1.4	8.4	3.4
TAN	3.4	1.6	5.3	2.0
UGA	4.2	2.0	7.5	3.9
ZAM	4.2	2.1	6.4	3.6
ZAN	3.7	1.7	5.9	3.0
Total	5.1	2.1	8.7	4.9

Figure 1 Percentage of pupils attaining various levels of mathematics achievement



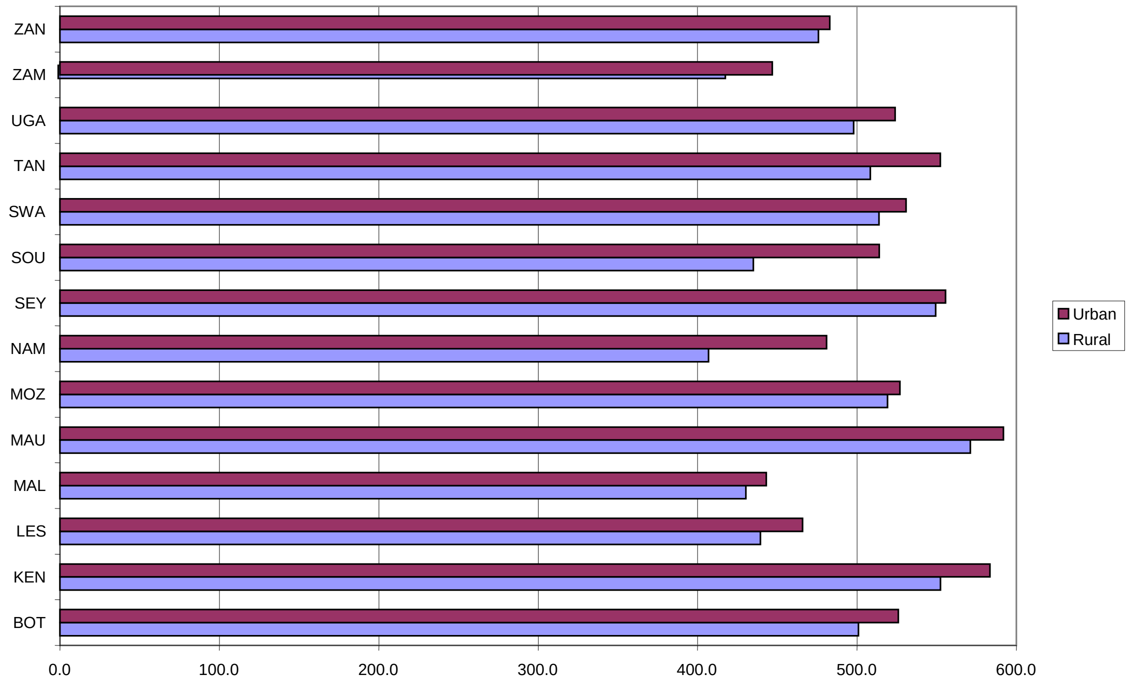
Source: Ross, K. N. et al, (2004). SACMEQ Data Archive

Figure 2: Gender differences in mathematics achievement



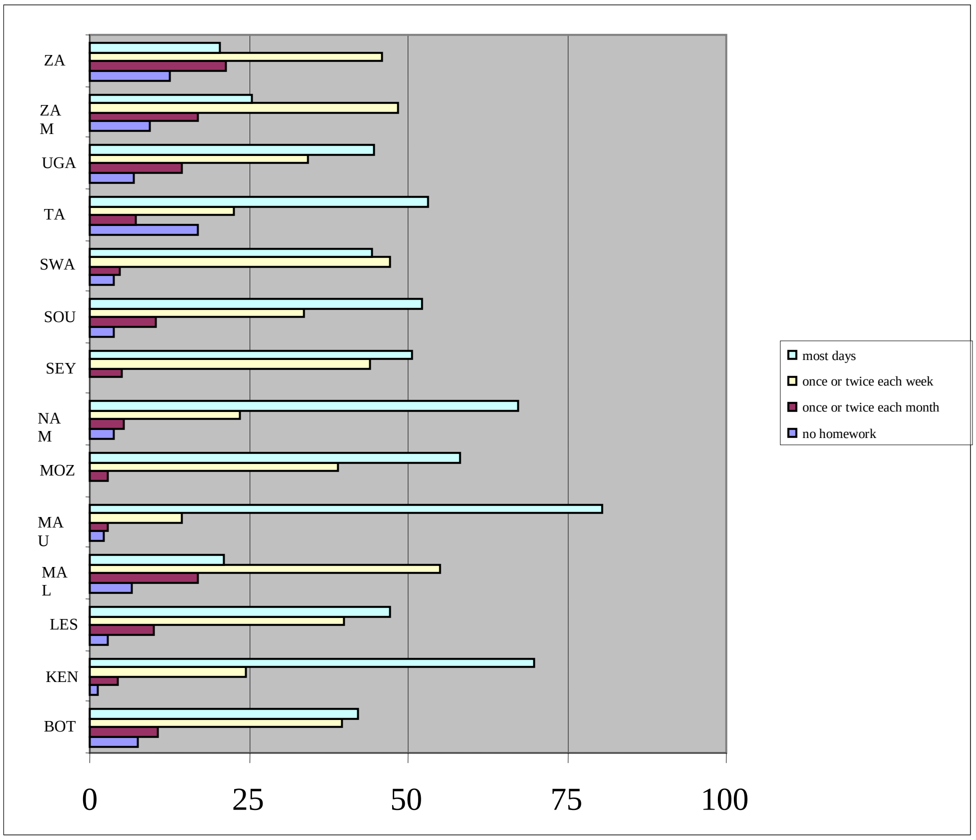
Source: Ross, K. N. et al, (2004). SACMEQ Data Archive

Figure 3: Mathematics achievement by school location



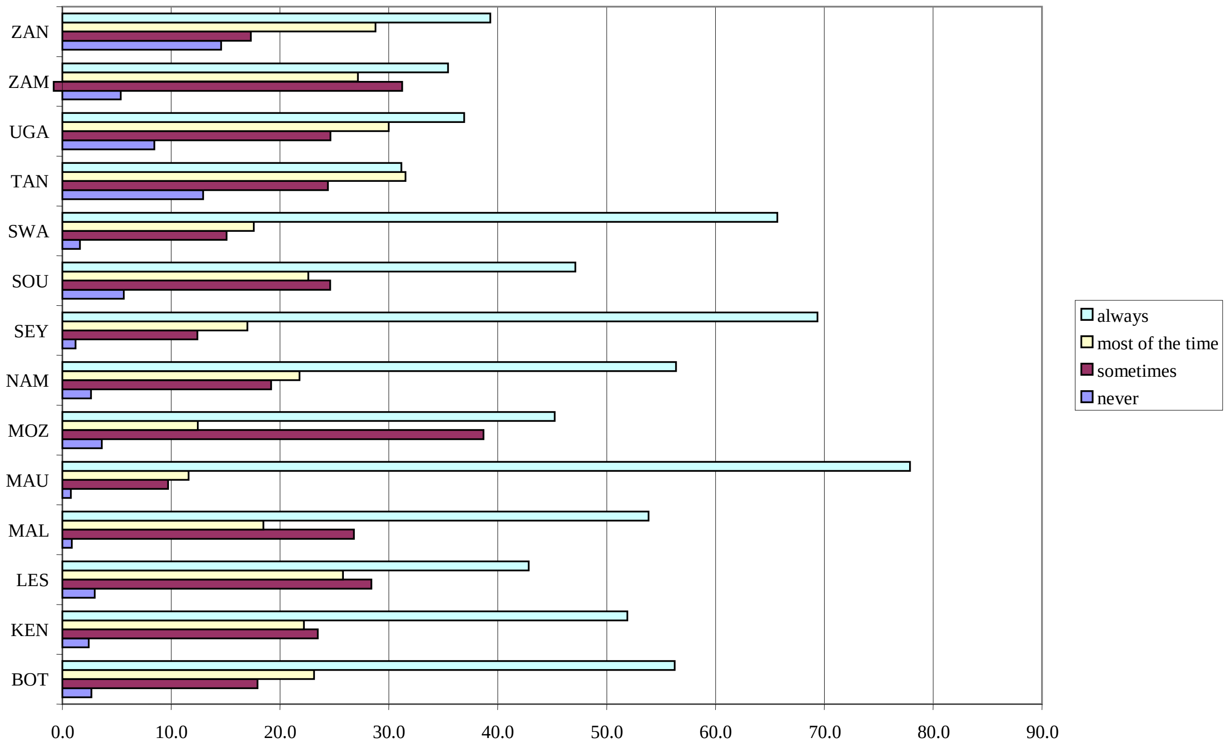
Source: Ross, K. N. et al, (2004). SACMEQ Data Archive

Figure 4: Frequency at which pupils are given mathematics homework



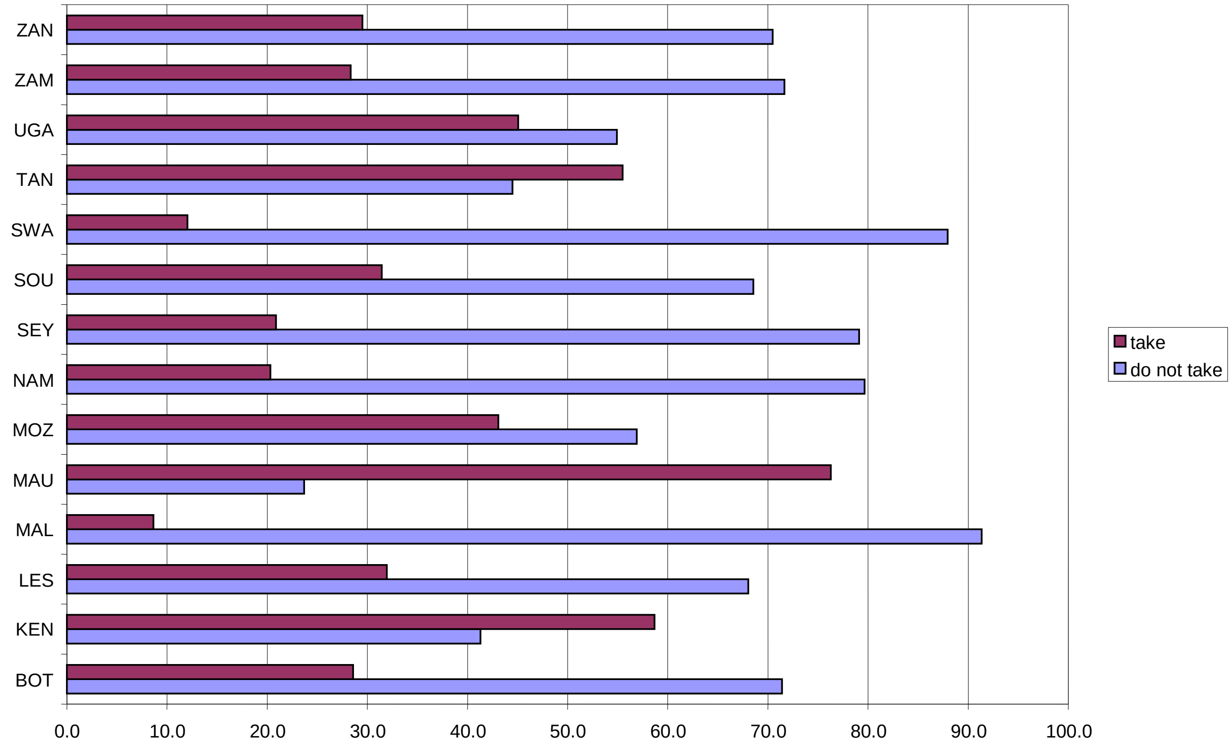
Source: Ross, K. N. et al, (2004). SACMEQ Data Archive

Figure 5 Percentage of pupils indicating how often their math homework was corrected



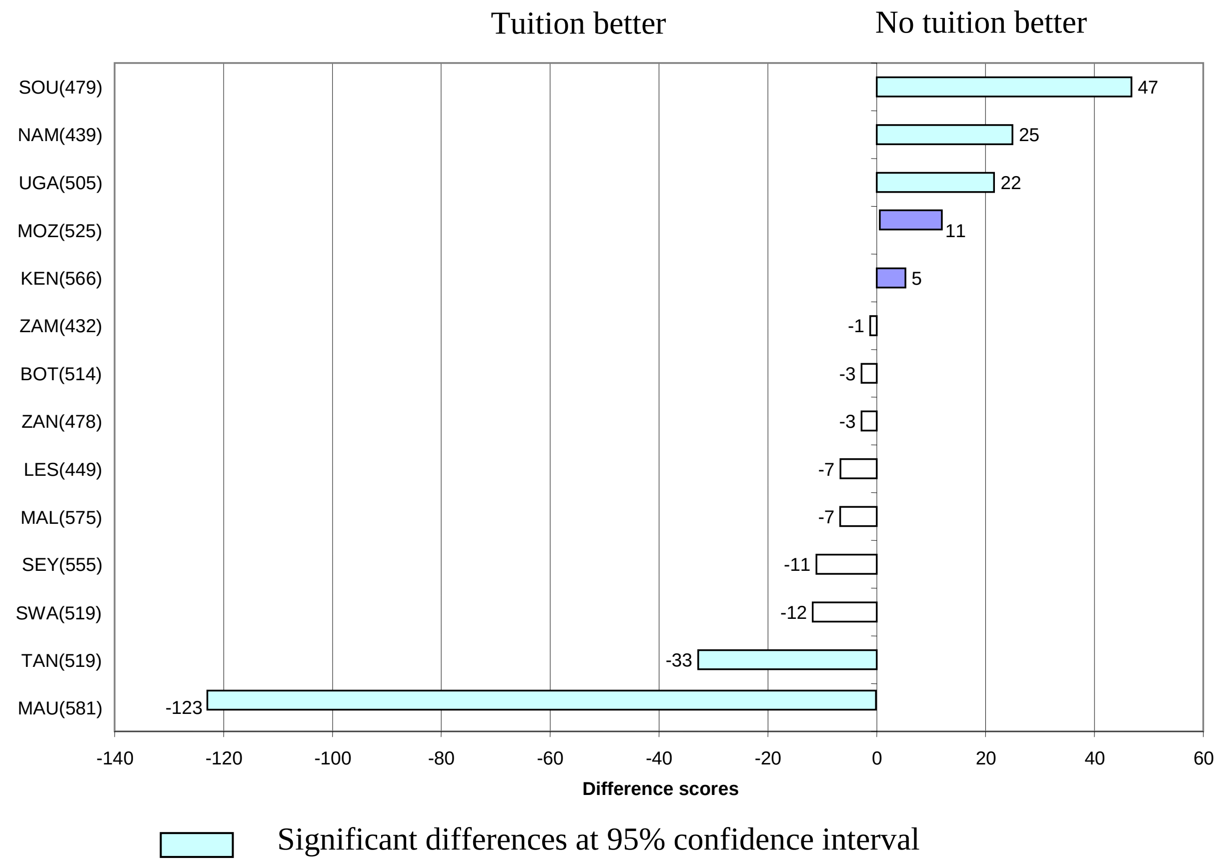
Source: Ross, K. N. et al, (2004). SACMEQ Data Archive

Figure 6: Percentage of pupils taking extra tuition



Source: Ross, K. N. et al, (2004). SACMEQ Data Archive

Figure 7: Differences for pupils taking extra tuition vs those not taking extra tuition



Source: Ross, K. N. et al, (2004). SACMEQ Data Archive