Streaming in Seychelles: From SACMEQ Research to Policy Reform

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Results from the SACMEQ study have the potential to influence policy reform in systems of education in developing countries and may be shaping the development of education in Seychelles. In this paper, specific results of the distribution of pupil achievement scores in reading and mathematics from fourteen countries participating in the SACMEQ II Project have been analysed to investigate sources of variation. The large variation in the context of Seychelles has been related to the selective effect of ability streaming in the primary school system in Seychelles. Through a description of the persistent nature of this practice some of the equity problems, in terms of learning outcome, teaching learning environment and gender disparity, associated with it have been identified. The ways in which cross-country comparisons of the magnitude and source of variation can be used to situate and clarify the country-specific issue of streaming have been explained. By considering the links that could be developed between international and national research and reform measures in the education system Seychelles an interactive process of policy reform which includes information dissemination, policy dialogue and policy action have been discussed.

Introduction

There has been an increased worldwide demand for reliable research information to inform educational policy. Complementarily, there has been a growing interest in large-scale scientific surveys in which educational systems are compared. One of the challenges when making such comparison is to provide an international context in which salient features of individual systems can be highlighted to deepen understanding of country-specific education issues that would assist educational planners to initiate reform measures.

One of the main goals of SACMEQ (Southern and Eastern Africa Consortium for Monitoring Educational Quality) is to inform educational planners about high-priority areas that would lead to policy action, and the Ministry of Education in Seychelles in pursuit of quality as articulated in EFA fora has become concerned with a range of educational issues. In particular, the practice of streaming in primary schools has received considerable attention as it has become quite clear from the SACMEQ report (SACMEQ II Seychelles Report) that this widely-used practice might be threatening the principles of educational equity and inclusion.

The purpose of this paper is to explore the relationship between the SACMEQ research findings and policy reform in Seychelles. To place the relationship in context, a cross-national analysis of the variations in learning outcome in reading comprehension and

mathematics will be carried out: such an analysis will be a prerequisite to the interpretation of the between-school and within-school variations in the fourteen SACMEQ school systems including Seychelles. The achievement gap will then be linked to the "so-called" ability streaming in Seychelles, and the practice of streaming and its effect within primary schools in Seychelles will be described. Finally, the way the research findings have been used to influence policy–makers, propel and guide policy action will be discussed.

Variation in Pupil Scores

In a school system, there are two basic components of variation (as measured by the standard deviation, SD) which need to be examined to interpret levels of equity: the component of the variation that is associated with variation among pupils between schools (between-school variation) and the component of the variation that is associated with the variation among pupils within schools (within-school variation). The former is a measure of the variation of pupils achievement scores attributed to differences among schools; it shows whether pupils are achieving at similar levels across a school system; the latter is a measure that indicates the variation in pupils scores which would be due to particular factors within schools.

Variation in pupil reading scores

In Figure 1 the overall mean values for the reading scores for pupils and the standard deviations of those scores have been presented. On the left-hand of the figure, the fourteen SACMEQ countries have been listed and the mean score (standardized to an international mean of 500) for each school system has been shown in brackets beside the names of the countries; on the right-hand side, the list of countries have been duplicated, and the standard deviation measuring the total variation has also been shown in brackets. In the center of the figure, the standard deviation has been calculated in two components and represented graphically as the between-school variation on the left and the within-school variation on the right.

[Insert Figure 1 about here]

From the list of countries in Figure 1 on the right-hand side of the chart three groups of school systems can be identified according to whether the standard deviation values were well above, somewhat below or well below the average standard deviation value for SACMEQ (SD=100). The smallest amounts of variation among pupils occurred for Swaziland (SD=47), Mozambique (SD=42), Zanzibar (SD=50), Lesotho (SD=34) and Malawi (SD=25) with low values. Other school systems such as Kenya (SD=79), Tanzania (SD=81), Botswana (SD=78), Uganda (SD=83), Namibia (SD=75) and Zambia (SD=72) registered standard deviations values which were somewhat below the average. The largest amount of variation in pupils reading scores were noted for school systems in Seychelles (SD=153), Mauritius (SD=148), and South Africa (SD=150). These school systems had standard deviation values that exceeded, considerably, the SACMEQ average value.

It should also be noted that it did not appear that there was necessarily a relationship between the amount of variation in the pupil scores and the pupil mean scores in the various school systems. For example, although the mean value for the pupils score (on the right-hand side of Figure 1) in Seychelles (582) was very high and the standard deviation value was also high, other school systems such as Kenya (546), Tanzania (546) Swaziland (530) with relatively high mean values had relatively smaller variation among pupils. In addition, Botswana (SD=78) and Zambia (SD=72) had relatively lower variation among pupils but Zambia had low school system mean (440) while Botswana had high school system mean (521).

Variations in pupil mathematics scores

The information about mathematics achievement scores in Figure 2 was similar to that about reading scores in Figure 1. Figure 2 is best interpreted alongside Figure 1. As can be viewed in Figure 2, school systems with large variations were again South Africa (SD=119), Mauritius (SD=196), and Seychelles (SD=115), with the addition of Uganda (SD=118). The same group of school systems, namely, Swaziland (SD=45), Mozambique (SD=33), Zanzibar (SD=39), Lesotho (SD=36), and Malawi (SD=32) had low variations and similarly, school systems in Kenya (SD=76), Tanzania (SD=75), Botswana (SD=68), Namibia (SD=70), except Uganda, variations somewhat below the SACMEQ average occurred. For Mauritius the variation was extremely high, for Seychelles, Uganda, and South Africa it was relatively high.

[Place Figure 2 about here]

Again, the absence of a consistent relationship between the mean scores and the amount of variation can be noted. For example, Kenya had the highest mean score (563) after Mauritius (585) and the variation was about one-third of that of Mauritius; Mozambique with a mean score (530) somewhat lower than that for Seychelles registered a standard deviation value just over a quarter of that of Seychelles.

Large variation as measured by the standard deviation would be indications of substantial inequalities within school systems. Sometimes this situation occurs when there are large variations in socio-economic situation of pupils and schools, the human resources available to different schools, the selective procedures used in schools, or policies applied by certain schools.

Variation between and within schools

One of the ways of isolating some of the school factors that could be responsible for large variations in a school system is to calculate the proportion of the total variance which can be attributed to the proportion of the variation in a given school system among pupils scores *between schools* and the proportion among pupils scores *within schools*. These are represented for the fourteen school systems by bar charts in the middle of Figures 1 and 2.

As it can be deduced from the two figures, in all countries with the exception of South Africa, Uganda, Mauritius, and Namibia the between-school variation accounted for less than 50 percent of the total variation for both the reading and mathematics scores. For Seychelles the between-school variation amounted to less than 8 percent for both sets of scores. In contrast, South Africa had the largest between-school variation which accounted for 69 and 64 percent of the variation for the reading and mathematics scores, respectively. This is a fairly strong signal that there are substantial disparities in the characteristics of schools in South Africa.

A different situation presented itself when the within-school variation component of the total variation is examined on the right-hand side of the chart (Figures 1 and 2). In the SACMEQ countries most of the variation are within schools. Except for South Africa, Uganda and Namibia where the proportion of the within-school variation for the reading and mathematics scores was less 45 percent, in all other countries the percentage of within-school variation ranged from around 54 percent (in Kenya) to over 92 percent (in Seychelles) of the total variation. Mauritius and Seychelles really stood out: for Mauritius about three-quarters of the variation in pupils achievement in reading and mathematics occurred within schools; for Seychelles the variation within schools accounted for most of the overall variation in the achievement of pupils. This would indicate that different groups of pupils within schools encountered different teaching learning environment. This can result in the stratification of groups of pupils. In Seychelles the large within-school variation probably reflects the effect of the selective process of streaming which although not endorsed by the education authority had become a strong feature of most primary schools.

Streaming in Seychelles

Streaming has been inherited from the practice in early mission primary schools where some children were deemed to be "good at school" and they were placed into a different group from the others. Streaming by "ability" largely based on teachers' judgment and school assessment continued until the educational reform of 1978. This reform was meant to replace the selective system with a more egalitarian one, and, in that context, streaming was discouraged. However, the practice of streaming carried on covertly. It became so pervasive in the culture of schools that a policy stating that schools should not stream children before the end of P4 (Grade 4) was introduced in 1988 to reduce the tendency for schools to stream children as soon as they entered P1 (Grade 1) (if not before). Unfortunately, the implementation of this policy was not closely monitored.

Teachers like to organise their instruction for homogenous groups of pupils. Streaming has become accepted by the Seychellois society as a way of identifying the bright children. Head teachers feel pressurised to group children by ability. Although the Ministry of Education has expressed concern about children who are underachieving, streaming continued as an accepted practice and schools in Seychelles undertake streaming by placing children into "so-called" ability groups. This stratified grouping of pupils is translated into the considerable within-school variation in the Seychelles school system as depicted in the cross-national analysis.

A closer look at the national data might help to clarify this further. In the primary school system of Seychelles there are 24 primary schools and the whole of the P6 (Grade 6) population was tested. The number of streams depends on the size of the school. Of the 24 schools, four had one class only, ten had two classes, seven had three classes, one had four classes, one had five classes and one had six classes. The mean score in reading and mathematics for the different classes (streams) have been represented graphically in Figure 3.

[Place Figure 3 about here]

It becomes apparent that the pupils' achievement score in reading and mathematics is a consequence of their learning in a particular class within a school. Class 1 is the top stream, Class 2 the second stream and so on. Pupils in the top stream achieved well and performance declined progressively as pupils found themselves in the lower streams. It is evident that there were major gaps between pupil scores in the first stream and the sixth stream. The difference in the average scores between the top stream and the bottom stream was 263 score points for reading and 193 score points for mathematics. It has often been reported in large-scale international educational surveys (see Lunderg and Linnakylä, 1993, p.13) that half a standard deviation is equivalent to 50 score points on the international scale. Therefore, there was a difference of around four-and-a-half standard deviations between scores in the top streams and those in the bottom streams. This enormous variation in learner achievement among streams is alarming; it is easily about four years' of education. Unfortunately, it was only in the year 2001 (after the SACMEQ data was collected) when an inspectorate system was reintroduced that the inequity in the learning outcome of pupils was first mentioned.

Gender disparity

The practice of streaming not only differentiates between groups of pupils but it also has an impact on the balance between the number of boys and girls in those streamed classes, and this leads to unequal chances of scholastic success. Results of the P6 national examination in Seychelles showed a consistent pattern of boys under performing in most subjects. The results from SACMEQ showed that there were considerable differences between the boys' and the girls' scores - over one standard deviation for reading and nearly half a standard deviation for mathematics. In a cross-national study (Mioko, 2004) it was also found that Seychelles had the largest differences in the achievement scores of the two genders where boys where underscoring for both reading and mathematics.

[Place Figure 4 about here]

The under representation of boys in the top streams is strongly evident in Figure 4 (above). Although there were 785 boys and 761 girls in P6 (G6), in the top stream, the girls outnumbered the boys - 58 percent of the pupils were girls. But, thereafter, the boys outnumbered the girls and in the sixth stream 75 percent of pupils were boys.

It is obviously unlikely that girls are better learners than boys. It is more likely that streaming takes place very early (Leste et. al, 2002) even at the stage of early childhood education and it is influenced more by subjective and social criteria rather than ability. From some head teachers' views it is apparent that these judgments are related to pupils' behaviour, to influences of parents, to how young children adapt initially to the environment of the school, and to teachers' perception. These biased judgments tend to favour the girls who are looked upon as being more passive and less disruptive than the boys. Therefore, the practice of streaming favoured girls getting into the top stream and produced a selection bias that contributed to large gender differences in achievement.

Impact on policy

The cross-country analysis of the magnitude of the variation in the reading and mathematics scores and the between- and within-school components of that variation have brought out the differentiation effect in the education system of Seychelles. The in-country data have confirmed that the streaming mechanism is a major source of inequity in learning outcome. It has a negative impact on pupils' achievement in the lower streams in both mathematics and reading and the streaming issue has become entangled with the gender issue. These indications alerted decision-makers to the necessity to adjust the system in an attempt to reduce the learning gap. Thus, the Ministry of Education was faced with a major organizational, teaching and learning, policy-related problem of equity.

In the policy statement of the Ministry of Education (1999) in Seychelles equity is described not only in terms of access but also as the 'sharing of resources', the creation of 'conditions for optimum achievement by every group' and providing 'equal opportunities … of success to both genders'. However, the Ministry of Education lacked adequate information that can be used as a lever to influence the various stakeholders in education and remove some of the cultural obstacles to operating non-streamed schools. Also, an international drive was needed to justify anticipated reform measures. Moreover, this reform would need to be championed by a national group who would have the capacity to provide added knowledge and deeper understanding of the issue, be able to use the findings to promote the development of a policy against streaming and steer its way through the de-streaming process by stimulating research-based discussions and widening the perspective of educators and the local community.

Informing Policy-makers

Accessing reliable information was the first important condition to capture the attention and to solicit the engagement of policy makers. As the above analysis has demonstrated, the SACMEQ data presented in a systematic, graphic fashion is a powerful source of information which can influence the views of senior officials in education. Thus the first presentation of the SACMEQ results was in a number of senior management meetings which are the highest-level meeting in the Ministry of Education chaired by the Minister for Education.

The main purpose of these meetings was to contribute to the knowledge of decision-makers and educational planners on the effectiveness of the primary school system in Seychelles. By placing the initial analysis in the context of cross-system comparison, it was possible to base the equity debate on learning outcome and the general concerns of school systems with the quality of their basic education. This coincided with the recent policy statement of the Ministry of Education that placed a strong emphasis on quality, with a commitment to 'adopt a planned approach to education development based on systematic investigation and research'. Through comparison of mean scores an initial secure receptive climate was created as Seychelles was ranked amongst the first three countries in reading and mathematics. It was also necessary to comment on some of the technical aspects of the comparability of the data so that senior managers were assured that the standardized instrument provided reliable and valid measures. This allowed them to make an initial judgment of the achievement of students, and it highlighted some of the successes of the system.

The initial findings provided the necessary information to assess some of the initiatives of the Ministry of Education such as the development of structures to link the school with the home, the quality of the teachers, and the continued up-grading of school buildings, and enthusiastic comments ensued. It was also seen that the Ministry had been successful in achieving a good level of literacy and an equitable distribution of material resources in primary schools.

From this secure base of comparing mean scores, it was necessary to redefine equity and consider variation. The sequencing of the information from an international context to a national context provided the momentum to clarify some of the concerns of the Ministry of education with ability grouping. It was important to show the range of variation values for the different countries. The policy-makers needed to be convinced that a large variation is not necessarily associated with high mean. Countries, such as Swaziland have managed to combine a high mean average score with a fairly low variation. There again, the calculation of within- and between-school group variation had to be eased into the discussion to show that some countries would need to take a closer look at the causes of major inequalities. This helped to bring the concerns of Seychelles into sharper focus.

For example, comparisons of the components of variation between Seychelles a micro state and South Africa a large system was used to show that countries presented different problems and to promote understanding of the specific discriminatory effects of the streamed grouping of pupils. Seychelles together with South Africa had large standard deviation values. The interpretation of the within- and between-school variation would lead to the conclusion that whilst there were major differences between the types of schools in South Africa, there were large differences between groups of pupil within schools in Seychelles.

Just giving information is not enough to stimulate the changes that one would anticipate would lead to action. Other conditions need to be met to influence the policy-makers. Firstly, the way the information is presented must establish a framework to understand the issue - thus the cross-national approach. Secondly, the issue must be related to what

policy-makers have pronounced themselves on - thus the link between the equity issue and the policy statement of the Ministry. Thirdly, the information has to be managed to stress various aspect of the system - the different presentation was approached from different angles such as quality, efficiency and effectiveness. Fourthly, the information must guide senior managers to make decisions to follow-up. It had to encourage reflection and generate questions that would challenge the common assumptions about streaming that had taken root. It was important to show how the practice of streaming had infiltrated the system and that to eradicate it would need major system-level and school level initiatives.

Policy Dialogue

To initiate a policy dialogue and ensure that issues are well-debated, it is necessary to disseminate information to a wider audience especially those who would be part of the reform. The challenge is to link the comparative data with the in-country data so that interpretation can take place at different levels and emphasis placed on specific aspects of the problem to specific audiences.

Presentations were made to head teachers, school managers, School Improvement groups, other public forums such as the Parents Educators Council (which consist of the chairpersons of the Parent-Teacher Association) and in the Seychelles Child Development Conference where there were international as well as national audiences and representatives from different Ministries, especially the Ministry of Health.

In these presentations the evaluative functions of the SACMEQ study were exploited and it was advantageous to switch from a global to a local setting and vice versa. Through the comparative approach it was possible to establish the educational status of the primary school system in Seychelles, and factors that would have had a positive impact on achievement emerged. Factors such as the pupils and their homes, the characteristics of teachers and their teaching, facilities and resources could be commented on to generate discussion on the quality of those inputs and the achievement results in Seychelles. Government expenditure on education in Seychelles is very high and it is of general interest to make judgments about the result of this investment in terms of outcome. This also encouraged questions about what was considered as weak areas: low performers, poor motivation of the groups of children and children's behaviour that constrained learning. These were strategic moments to intervene with an examination of data on the distribution of scores across the SACMEQ countries and to explain what this meant in the primary school system in Seychelles in the way children are allocated to streamed classes. Thus another dimension was added to the evaluation – that of an equitable education system

It was inevitable that planners and other personnel from the public sector would want to discuss equity in terms of resources but it was also necessary to proceed from infrastructures and resources to learning outcome. The challenge was to bring in the data from the SACMEQ report which reinforced the general view that school building have been an important consideration at the Ministry of Education and that the physical

resources in the primary schools in Seychelles were in a fair state and to develop an argument about the fairness of having equitable learning outcome. It had to be pointed out that certain aspects of the organizational features of the school environment itself might discriminate against some pupils within a school. It was at such junctures that planners and education practitioners opened a professional dialogue and these interactions were facilitated by an analysis of variations in achievement scores.

By presenting in-country analysis and comparing graphically the low variation in the reading and mathematics scores of individual schools and the large variation between the various classes, the system feature of streaming were explained. Questions were raised about the achievement gap and the teaching learning problems with the lower streams. Teachers began to question the way classes were organized and to ask whether it was in fact possible to have "straight homogenous classes". Some teachers began to realize that not even the first stream was homogenous. This led to a discussion on the traditional approach embedded in the culture of schools, strategies used for mixed-ability teaching, and the need for training. Head teachers on the other hand felt that many teachers wanted pupils to be organized in ability groups, even though they, the head teachers were aware of the problems this caused. Some of the behaviour problems were related to the alienation of groups of pupils in the lower streams. Some parents began to vociferate about the unfairness of the system when their children are placed in low streams whilst others felt that streaming was inevitable and it was "part of life". It also emerged that some parents blamed their children for finding themselves in the bottom streams. One member of the Parents Teachers Council captured the essence of the conflict that existed within the community about streaming. He said: "streaming is OK as long as my child is in the first stream."

Gender equity is a common theme in many of the discussions nationally and in education. The gender issue related to streaming generated further interest as it was shown that amongst the SACMEQ countries, Seychelles had the largest differences in the reading and mathematics scores between the genders with boys under performing in both learning areas (Myoko, 2004). The possible link to streaming was further emphasized as more national data was brought in. The preponderance of boys in the lower streams and the gender gap in learning outcome raised some serious questions about gender equity. Although the gender imbalance in the number of boys and girls in the different classes had been a cause for concern there had not been enough data to show the gravity of the problem and to consider that streaming seemed to aggravate the problem. Added information from a local study which, in fact, was prompted by the SACMEQ results was also commented on as it showed that the learning gap between boys and girls could be detected in P2 (Grade 2) and the gap became larger in P4 (Leste et. al., 2002). This led to some strong reaction about the practice of placing pupils into classes and it was pointed out that some parents put pressure on head teachers (as pupils are moved from crèche to the first year of primary school) for their pupils to be with a particular teacher who happened to be a popular teacher who happened to be teaching the top stream.

Developing a policy dialogue is a dynamic process. The international data can be a powerful energizer to start of the process. As we have seen the formatting and the

marshalling of the comparative data provided a general framework to study the organizational features of streaming in primary schools: most decision-makers, planners and leaders would be concerned with the notion of equitable educational provision. Also, international studies can be used to confirm some of the findings of local studies and to extend research data with experiences of professionals in the field. This can lead to enlightened discussions as teachers, parents and school officials begin to identify with their varying interests and in doing so outline some of the aspects of the problem from their viewpoints. It is through such interchange and interactions in the policy dialogue that common grounds are established that could lead to a more action-oriented perspective.

Policy Action

The structuring of a renewed perspective on streaming was derived from the cross-country analysis of the SACMEQ data on variation of pupils' achievement scores and the interpretation of the results in the context of the organizational feature of primary schools in Seychelles. Through the wide interactive dissemination processes the knowledge about streaming was enlarged and some of the educational and social problems associated with that practice were discussed from the viewpoints of various stakeholders. By engaging decision-makers in the process of gaining increased understanding of the policy concerns related to the streaming issue a decision was made by the Senior Management Committee to centrally allocate pupils to classes as they entered the first year of primary schooling and to set up a De-streaming Working Committee.

The terms of reference were to:

- Review previous policy on streaming with a special focus on primary schools
- Assess the grouping structure in the first year of primary schooling with regard to the recently introduced practice of non-selective allocation of pupils to classes
- Gather the views of head teachers and teachers on this recent practice
- Formulate a policy memorandum on non-streaming in the primary school
- Develop a plan to implement the non-streaming policy in the primary school

This group which consisted of educational planners, managers, school heads and the researcher, himself, was nominated to spearhead the reform. The researcher played a key role in the group both as information giver and facilitator but especially to ensure that the analytical stance was maintained and to use the data and research findings as reference points. Emphasis was placed on reducing the wide gap in learning outcomes measured in the SACMEQ study at P6 (SACMEQ II, Seychelles Country Report, 2004). The study of other research findings on the negative effects of streaming (see Oakes et. al, for example) and some exposé on the psychological process of differentiation and polarization in group formation (Lacey, 1970) that would affect

pupils as they are streamed in ability groups stimulated much discussion. The researcher was also able to bring some of the main concerns from the deliberations in the dissemination exercises and other documentation on de-streaming or de-tracking in other countries such as Hon Kong (Fong Fu Yong, 2003) and USA (see Buriss and Welner, 2005, for example) and to forge a common outlook that would converge towards the formulation of a policy statement.

The non-streaming policy statement was presented as a policy memorandum. It indicated that the Ministry of Education was re-positioning itself on this issue after extensive international and local research results had shown the divisive effect of streaming and its adverse impact on achievement. It aligned itself with the principles of equity and inclusiveness. It expressed the Ministry's commitment to establish non-streamed classes and implement appropriate teaching learning environment that would cater for all learners. Reference was made to some of the enabling conditions: the organization of heterogeneously grouped classes, promotion of mixed-ability teaching, provision of training and soliciting of parental and societal support. It proposed a phased-in approach and the introduction of a monitoring mechanism.

It should be noted, here, that the policy-dialogue process, the development of the policy statement and the design of an action plan did not progress in a linear fashion. In fact, the reform activities of the De-streaming Working Group was happening alongside the dissemination and sensitization programme and since the researcher formed part of the working group, it was possible to clarify issues, to feedback information from the various stakeholders into the group, to consider areas of conflict. For example, switching to teaching heterogeneous groups was quite threatening for teachers who felt that they had not received adequate training. On the other hand teacher trainers maintained that mixed ability teaching was included in their programme. This is an instance where the strategies for mixed ability teaching needed to be re-defined to consider instructional approaches such as differentiated teaching and mastery learning so that both teacher trainers and teachers share a common view. In fact, the consultation was happening at the same time as the crafting of the policy statement, thus creating dynamic exchanges between the various stakeholders and the work of the planning group, and these merged into the development of an action plan.

The action plan had a number of dominant features. These features emerged as the international and within-country variation data were explained, the streaming issue was studied within the working group forum and the factors were identified from the policy discussion and further literature on teaching and learning in a mixed ability setting.

Learning Environment: It was acknowledged in the action plan that certain conditions had to be met to create optimum teaching learning environment that would facilitate the teaching of non-streamed classes. There would be a need to review some of the problems with the transition of pupils from Crèche to P1: this would involve re-establishing a familiarization programme for teachers of Crèche and P1 (Grade 1).

Teaching non-streamed classes would demand an increase in the provision of teaching learning resources and the development of appropriate material to support more interactive teaching methods. Other initiatives which were already underway as part of the plan of the Ministry of Education, such as, the reduction in class size would have to be integrated within the reform programme. The action plan also referred to the sensitization of parents and members of the community at large to reduce possible resistance that may have a disrupting effect on the learning environment of the school.

Curriculum: A rigid curriculum can be constraining for teachers and in teaching mixed ability classes it can easily lead to what has been described as "teaching to the average" or "watering down" the curriculum or offering a "remedial" curriculum. Such situations are on the whole de-motivating for high performing pupils and can be disadvantageous to other groups of pupils. The curriculum would have to be made more flexible to encourage more innovative problem-solving pedagogy. Also measures should be taken to review timetable arrangements, extend curriculum networking, and support specific teaching learning concerns.

Training: Lack of training was one of the main concerns which emerged from the policy-dialogue. Teachers felt that they have not been adequately prepared to teach mixed ability groups. This is understandable since as it was pointed out, historically, streaming had been part of the school system and this must have had some influence on teacher training which is reflected in the tendency for trainee teachers to prepare lessons for "high", "average" and "low" ability classes. Provision for both pre-service and in-service training would be made in the action plan. Teachers would have to become acquainted with some of the more progressive ways of organizing activity groups and developing effective teaching learning situation in the mixed-ability classroom. Some of these would include pair work, flexible grouping practices, independent problem-solving projects, and integrating learning experience around themes. Teachers would need to become familiar with heterogeneous classroom methodologies and become convinced that de-streaming would benefit pupils, reduce the learning gap, and improve performance.

Monitoring: Three levels of monitoring have been anticipated: monitoring of the different activities within the plan, monitoring the sequencing of various aspects of the plan and long-term evaluation of the non-streaming policy. In the action plan a time frame for each activity or sets of activities have been included and the specific sections or individuals responsible at the Ministry of Education have been identified. Those groups or individuals with the specific tasks or activities will provide the first line of monitoring. It has been anticipated that implementation will be a continuous cycle of taking action, troubleshooting, evaluating, and adjusting the plan. The international data can be used to set a baseline against which the success of the de-streaming policy can be evaluated. The action plan has a span of five years when it is anticipated that all grade levels would have been de-streamed and mixed-ability teaching implemented.

Conclusion

In this paper the importance of presenting data and communicating information to decision-makers to inform policy has been emphasized. It has also been demonstrated how specific information on variation in achievement scores could generate a discussion on equity from an international to a national context and, in particular, streaming in the Seychelles education system. Finally, and attempt has been made to link research findings and the outcome of policy dialogue with policy reform in Seychelles.

It may be necessary at this stage to reflect on the role of the researcher in dealing with policy issues. Many researchers have outlined the use of international comparative research for policy reform (see Kellaghan, 1996, for example), and the interface between research results and educational planning has received some attention (Postlethwaite and Ross, 1992). However, the long and sometimes complex process that leads from research findings to policy action has not often been clearly described. One of the possible reasons is that the involvement of the researcher in policymaking has not always been acknowledged. An important element in establishing the crucial link between research and policy action is the dynamic, pro-active, and planning role that the researcher has to adopt to have an influence on policy-makers and educational planners.

The role of the researcher as information provider has been commented on, above: the researcher should be able to assemble relevant, detailed and appropriate information to enlighten decision makers and educational planners (Kellaghan, 1996). Moreover, the information has to reverberate with special concerns of policy-makers and reflect the needs of specific groups at different decision-making levels (Ross and Mählck, 1990). In our case, the equity issue has pre-occupied the Ministry of Education in Seychelles for some time and managers, teachers and concerned parents have voiced their views on the underachievement and lack of motivation of groups of pupils. In addition the researcher needs the stamina to initiate, sustain and facilitate policy-dialogue. This role has been described as that of a policy 'entrepreneurs' (Kingdon, 1984) or policy advocate (Porter and Hicks, 1997).

But the most challenging role for the researcher is to enter into a policy action role. He may need to become part of the technical team. He may need to use the necessary information to nudge the policy development process His expertise can help to provide added information, to carry out added research and to guide the direction of the policy development. He has to ensure that the research findings, the analysis, the extended information and the explanations are in keeping with the objective of the policy. He has to promote the interactive model of policy-making as proposed by

Gridle and Thomas, 1991. It is in this role that the researcher sought to strengthen the link between research findings, policy-decision, and policy reform.

A number of policy actions have resulted from the SACMEQ data which have been used by the researcher to set and re-vitalise policy agendas. A national project for improving pupil's achievement in mathematics has gained impetus from the international comparison of levels of achievement in mathematics and the researcher has had major inputs in the implementation of the project from carrying out an audit, participating in national conferences, merging the SACMEQ data with child development data for a longitudinal study of achievement (Leste, 2004) and collaborating with mathematicians to devise intervention strategies. The SACMEQ findings established that girls tended to reach levels of achievement that were substantially higher than those of boys, this has prompted a research study of the learning gap and the results of this study have been fed into the policy dialogue. It was also found through the SACMEQ results that a group of children were still non-readers after having reached the end of primary education: an evaluation of the special needs programme (which had been put in place the year before the SACMEQ data was collected in 2000) has been proposed with the researcher as co-manager of the project.

SACMEQ has provided the background, the methodology, the capacity and the policy information to influence changes in the education system of Seychelles, the researcher without losing his analytical stance has to manage a variety of roles to strengthen the link between research finding and policy action and provide impetus for change.

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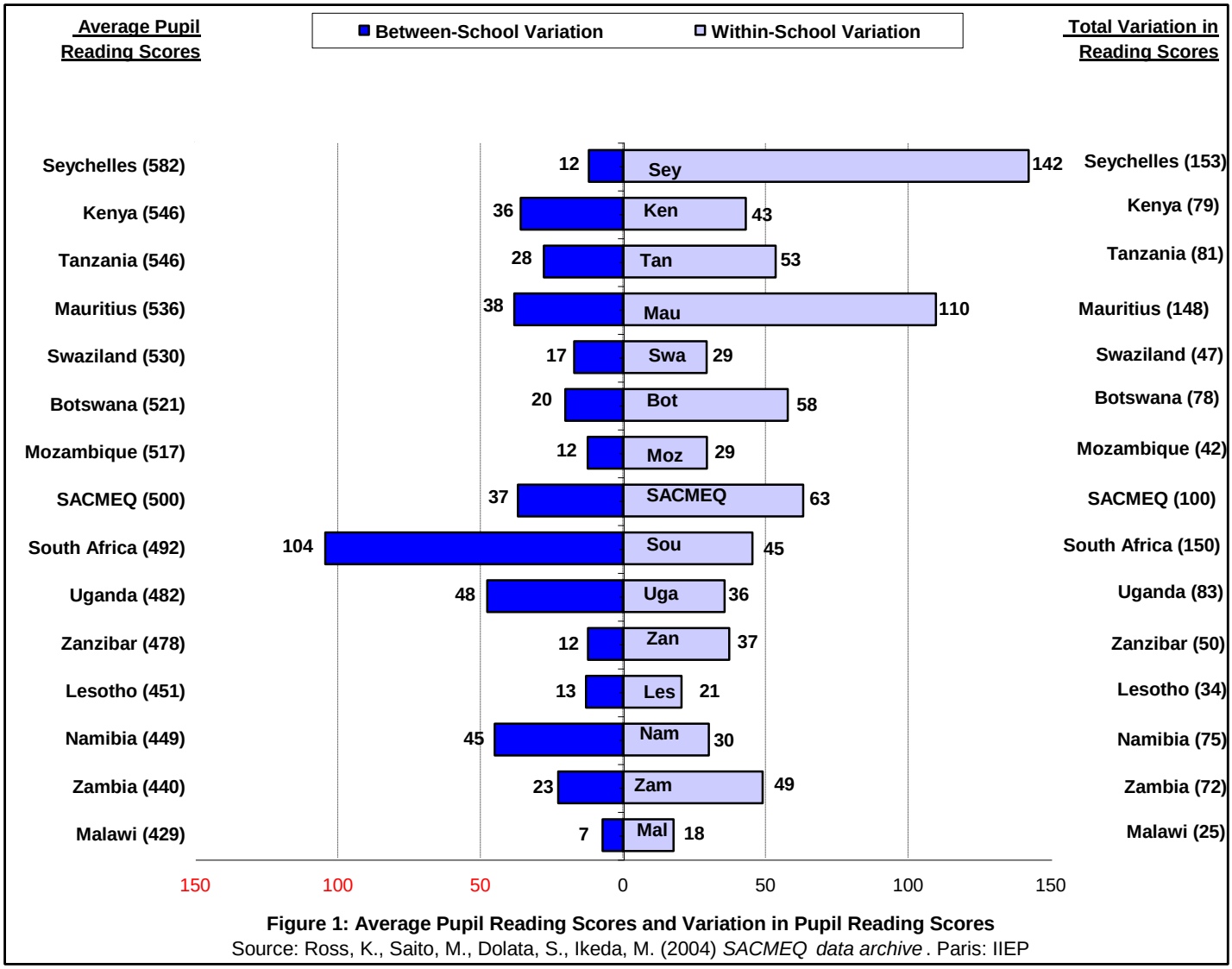

Figure 1: Average Pupil Reading Scores and Variation in Pupil Reading Scores

Source: Ross, K., Saito, M., Dolata, S., Ikeda, M. (2004) *SACMEQ data archive*. Paris: IIEP

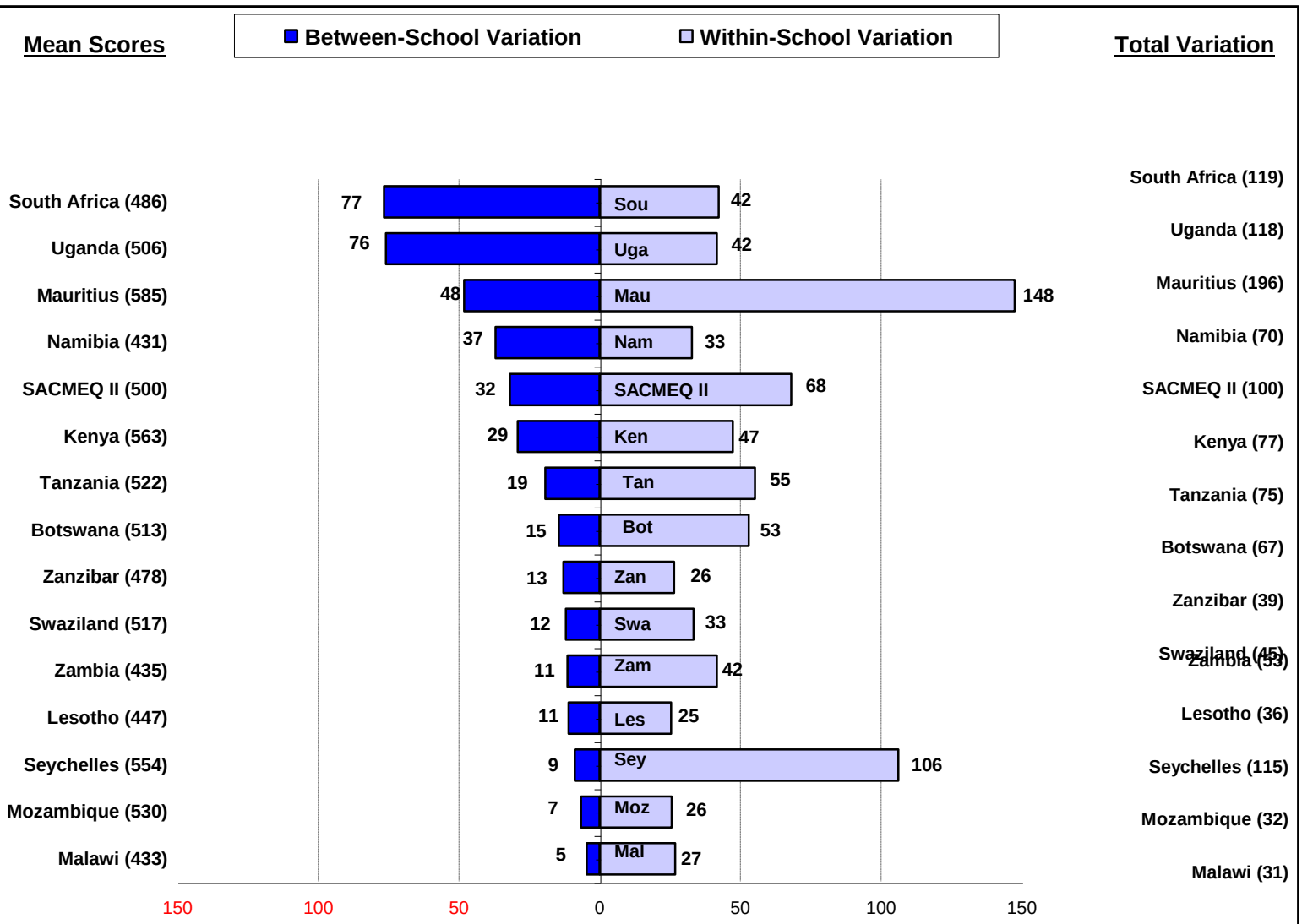

Figure 2: Average Pupil Mathematics Scores and Variations in Pupil Mathematics Scores

Source: Ross, K., Saito, M., Dolata, S., Ikeda, M. (2004). *SACMEQ data archive* . Paris:IIEP

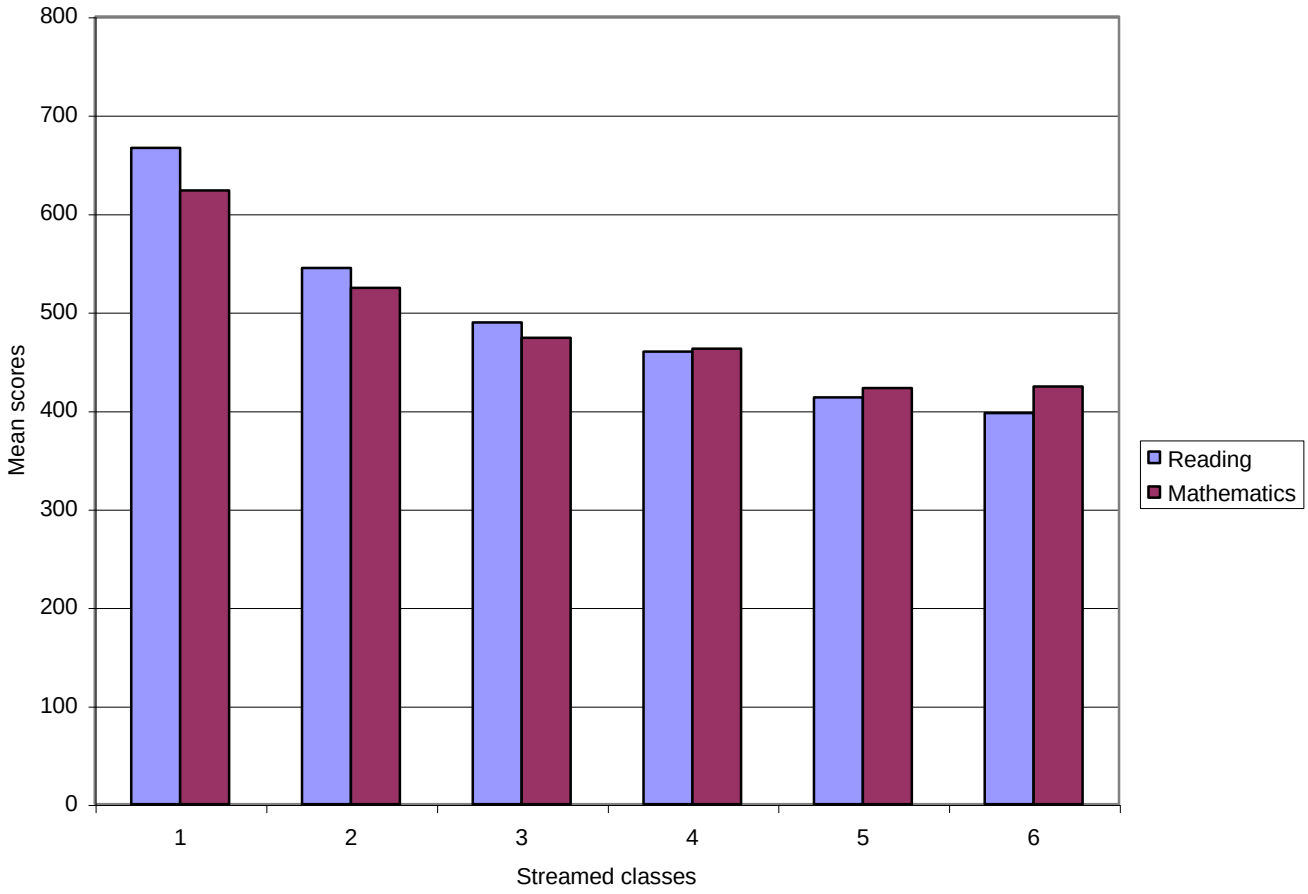

Figure 3: Variation between streams

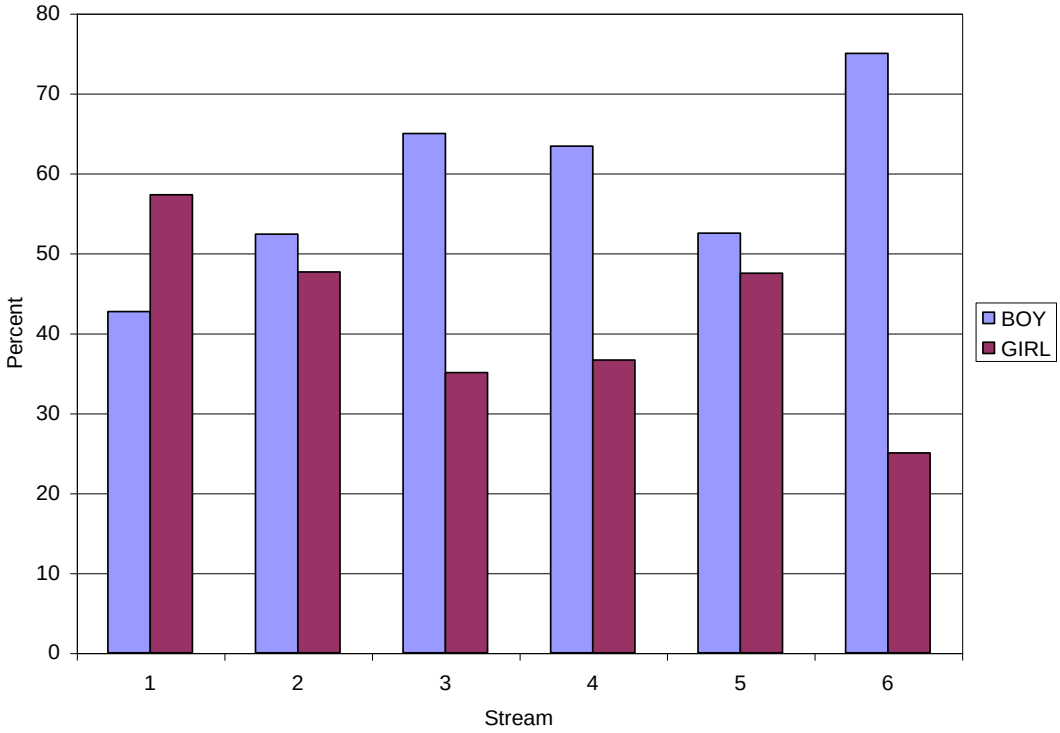

Figure 4: Boys and girls by stream