

Improving Educational Quality
(IEQ)

**Feasibility of
Multi-National Analysis**

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I. Introduction

The purpose of this paper is to generate discussion on the usefulness and importance of cross-national study to inform IEQ work and the education community worldwide, to discuss potential opportunities and options for carrying out cross-national study and to demonstrate the benefits and challenges through a case study on the feasibility of analysis on existing IEQI databases.

A. Context

The Improving Educational Quality (IEQ) project serves as a major vehicle for the Agency for International Development (USAID) to provide technical assistance to developing countries to conduct research and utilize findings as the basis for innovations that hold promise for improving the quality of students' learning experience. The IEQ goal is to improve the understanding of how and why classroom-based activities and approaches influence the development of basic learning competencies in developing countries. Over the eight-year history of IEQ, the project has collected data on classroom practice and learning situations as they relate to student performance in a number of countries. However, as the focus of IEQ has been to use research results to inform policy and practice in individual countries, no attempt has been made to date to examine commonalities of experience cross-nationally.

B. Relevance of Cross-National Study

A principle of IEQ is to "illuminate the reality of how the education system (e.g. schools and classrooms) fosters or inhibits teaching and learning." "As data will be collected in all countries that focus on cohorts of children within clusters of classrooms and schools, comparisons can be made in terms of background characteristics, classroom interaction, school context and system support variables cross-nationally". (IEQII technical proposal for Task Order 1)

Moreover, IEQ work is to improve the individual and institutional capacity of researchers to improve the relevance and credibility of their research. The requirements of cross-national study demands a level of rigor that is one way of ensuring such credibility and relevance.

Carrying out a cross-national study to determine the factors that influence performance outcomes in primary school children is very appropriate especially as an attempt to better understand and improve quality of education at the primary level in the educational system and to improve research and analysis on primary education.

C. Purpose of Paper

This paper is meant to support the researchers and their work in each of the IEQ II countries. It also presents opportunities in which IEQ can better inform others working in educational reform about improving learning through the research and experience the project has accumulated cross-nationally.

D. Background/Literature Review

Much of recent USAID-supported basic education has been developed from two related theoretical approaches: constructivism and school effectiveness. The first relates to the broad literature emphasizing the active and meaningful participation of all students in the learning process. The second refers to the importance of the school environment in developing quality learning opportunities, especially in developing countries. Combining these influences, IEQ strategy and research in developing countries has been based on the conclusion that *process and inputs can have a positive effect on learning and achievement in developing countries.*

E. Education Quality and Effectiveness

According to Ginsburg and Schubert (2000), IEQ follows Adams (1983) who distinguishes definitions of quality that can focus on one or more of the following aspects: inputs, processes, content, outputs, outcomes. Ginsburg et al. highlights the relationship between quality and effectiveness – or the degree to which goals or objectives are achieved. Heneveld et al. (1996) defines effectiveness in terms of student outcome related to participation, academic achievement, social skills and economic success. Within IEQ, country studies have organized around different definitions of educational quality. In Uganda, a modified Heneveld model was used which defined quality in terms of pupil behaviors, experience and expectations. In Guatemala, where a Vygotskyan perspective was used, effectiveness of interventions were also measured in terms of pupil outcomes and behaviors.

In this study, quality refers to outputs: what pupils learn. Quality education or effectiveness of primary education is to be understood in terms of pupil academic performance outcomes and their behaviors in the classroom.

F. Significance of Classroom

The education development hypothesis fundamental to IEQ research is that change takes place at the classroom level. Classroom level interventions – teacher training, educational material development and active learning methodologies – have been the basis of IEQ interventions and research. Hammersley (1986, as cited in Ginsburg and Schubert) notes, “if we are to understand the work of schools and to improve or change their role, then above all we have to understand what occurs in classrooms....where the real business of education is supposed to take place.” While, IEQ research has focused on cohorts of children within their different learning context - within classrooms

and schools - classrooms themselves have not been the unit of analysis in individual country contexts. The IEQ focus on learning at the classroom level suggested that individual country data might be amenable to manipulation that would allow cross-national comparison. Therefore, this paper explores the classroom as the unit of analysis for cross-national study.

G. Performing Cross-National Analysis on IEQ Data

a. Meta-Analysis, Trends Analysis and other Methods for Cross-National Study

IEQ research is a collection of independent research projects occurring across many countries. While each research project has grown from the principles and theoretical underpinnings upon which IEQ is based, the designs, research questions and variables often differ. The initial step in cross-national analysis is to gather all related studies and organize the data in terms of presence of dependant or outcome variables and identifying the aspects or elements defining each variable. Next, a presentation of the independent or predictor variables associated with the outcomes needs to be created. Once the research questions, dependent variables and predictor variables have been identified, an assessment can be made of the most appropriate analysis procedure.

Meta-analysis is a set of statistical procedures designed to integrate the results of independent studies that address a related set of research questions. The proposed benefits of meta-analysis is that through accumulating results across studies, a more accurate representation of the population emerges than was provided by the individual studies. As such, meta-analysis is a statistically powerful technique which works through estimating the magnitude of effect size. However, unlike traditional research, in meta-analysis, each study provides a single data point rather than data statistics being applied on individual subjects. Therefore, guidelines must be established to ensure reliable and valid synthesis of the studies and the appropriateness and usefulness of carrying out meta-analysis depends on similar research designs and variables. (Lyons, 1997, Chesterfield, ??)

Cross-national analysis through the comparison of trends across individual studies provides greater flexibility than meta-analysis. Correlational analysis does not require assignment of students or teachers to treatment groups and therefore can be used to compare the experiences of naturally created groups of individuals (for example, children in classrooms) and to study things that would be nearly impossible with an experimental approach as opposed to semi-experimental. Therefore, even if research designs are not the same, but similar dependent and independent variables exist, we can look at relationships cross-nationally. Similarly, performing exact tests can offer an opportunity to analyze research with small sample sizes, like those found in some IEQ studies. Exact tests are always reliable regardless of size, distribution, sparseness or balance of the data.

II. Case Study: Feasibility of carrying out cross-national study with three IEQI data sets: Ghana, Uganda and Guatemala

A. Cross-National Analysis Questions

The principle objective of the case study project was to determine the feasibility of conducting cross-national analysis using correlational statistics with existing data. The research questions were:

- 1) Are research questions and research designs similar across studies?
- 2) Are there data available in each of the country studies to allow the examination of cross-national trends as to what factors are related to pupil learning within the classroom?
- 3) Do data exist within each country study related to factors inside the classroom, for example, teacher and pupil characteristics and behaviors, instructional methodology and context, use of instructional materials, etc. that can be related to pupil performance at the classroom level?
- 4) What data exist across all IEQ research related to factors outside the classroom, that is, influence and attitudes of parents, community, etc. that may be related to pupil learning?
- 5) Were the data for the variables under analysis in the country studies collected and recorded similarly across country research? What data are available in numerical form and in databases? Can the data be aggregated/ disaggregated at the classroom level?
- 6) Are there any cross-national trends that appear to be salient and support further research?

B. Method

Databases, codebooks and instruments were requested for the IEQ I research from Uganda, Guatemala and Ghana. The level of effort in obtaining the databases was greater than originally anticipated owing to difficulties in gaining access to older databases and the lack of comprehensive and clear codebooks for some of these databases that required reconstruction efforts. In all cases, incomplete information was retrieved. The difficulty in obtaining the research data needs to be understood in relation to the IEQ principle of local capacity and ownership of research. All activities were undertaken to ensure that research data was developed, implemented, analyzed, reported and stored locally. As such, no central library of IEQ data existed at the start of this study. Research advisors who had been working on the IEQI projects were contacted and requested to assist with compiling the databases, codebooks and instruments.

Trip and research reports were reviewed to create a matrix of categories of variables. As the databases were received, a list of the variables and their format was made for each country. Review of databases and reports showed that all countries generated quantitative as well as qualitative data about the classroom environment and pupil performance within that environment. The analysis of quantitative data provides an opportunity to test the assumptions that cross-national analysis is feasible. Statistical methods can be used to assess relationships between the experience of children in different classrooms with pupil achievement and compare trends across the countries. A correlational study was used as the investigative strategy in order to accommodate for the differences in contexts, reform interventions and groups across countries. However, this limited the study to variables that were or could be constructed as numerical data.

H. Procedural Issues of Relevance to Cross-National Analysis

a. Design

Table 1 presents the general features of the three research studies examined in this feasibility study. The following paragraphs discuss the relevance and issues of each of the research factors in terms of the feasibility of cross-national analysis of the classroom as relates to design, sample and unit of analysis.

Table 1. Design

	GHANA	GUATEMALA	UGANDA
Title	English Language Proficiency of Selected Ghanaian Primary School Pupils	<i>Nueva Escuela Unitaria</i> Pilot Program Study	Factors Influencing Effectiveness in Primary Schools ¹
Intervention	Teacher Training for English Language	NEU active, peer, and self-instruction learning program	None
Design	Longitudinal, comparison	Longitudinal, comparison	Baseline
Sample	14 primary schools	20 rural multi-grade single classroom schools	24 primary schools
Location	8 rural; 3 semi-urban; 3 urban	All rural	15 rural; 9 urban
Comparison	"Intensive" – 7 schools received teacher training (3 rural; 2 semi; 2 urban) "Non-intensive" – 7 comparison schools	"Experimental" – 10 schools implemented <i>Nueva Escuela Unitaria (NEU)</i> program "Traditional" – 10 schools	No comparison group
Classes	P2-P5 cohorts: baseline and 1 yr plus P6 final collection for P4 cohort	P1 and P2 cohorts followed for three years	P2 ² , P4, and P6 for a total of 648 students

Four issues related to study design have to be considered in conducting a cross-national analysis. These are: 1) the nature of the design (e.g. experimental, case study,

¹ The study's findings can be found in Carasco et al. (1996).

² P will be used to identify the year of primary school. For example, P1 would be grade 1 of primary school.

baseline); 2) the duration of the research effort (e.g. one point in time, longitudinal, cross-sectional over several years); 3) the methodology employed (e.g. qualitative, quantitative, multi-method); and 4) study sample (e.g. location, gender, grade)

Nature of the Design

Much of IEQ research are quasi-experimental studies with treatments groups associated with educational quality interventions. Quasi-experimental in that pupils cannot be randomly assigned to classrooms, nevertheless, IEQ researchers do have opportunities to randomly assign classrooms to treatment or control groups. The assignment of classrooms to receive different treatments creates classroom environments in which the context of learning is different and these differences can lead to different relationships between classroom process and inputs and performance outcomes. These effects can be magnified depending on the tools used to measure performance outcomes, i.e. classroom observation, curriculum-based assessment or scores on national exams. For example, active learning methodologies associated with treatment groups may correlate with classroom observation measures while control group performance correlates better with national testing. Therefore, it is important to separate treatment groups for analysis.

Duration of the Research Effort

The duration of research efforts differed. Change over time. theoretical constructs relating to active learning theories of cognitive development discussed in the background section that academic performance is the result of aggregate learning experiences over time.

Methodology

All three research studies employed a multi-method approach incorporating both qualitative and quantitative techniques and instruments. For the purposes of this study, it was decided to review the data that was quantified by the research teams into databases.

Sample

When sample sizes are small, it may not be possible to disaggregate the sample according to defined categories. This can diminish the validity of the analysis. In addition to issues related to treatment groups discussed above, cross-national analysis needs to take into consideration: 1) location of schools (i.e. rural, urban); 2) grade level; and 3) gender.

Location

Whether schools are located in rural, urban or semi-urban areas in developing countries is acknowledged to effect the level of inputs in a school. Teacher qualifications, pupil participation and educational resources have been shown to differ by location. Analysis

of the data generally requires that rural and urban schools are taken separately. In this case, only rural schools are present in all three studies and provide an opportunity for cross national comparison. While this was possible for Guatemala and Uganda, given the small sample size in Ghana, it was not possible to disaggregate the Ghanaian schools by location and still maintain adequate number of schools for analysis.

Grade Level

It is advantageous to compare the pupils in the same grade cross-nationally as each year of the school process is generally associated with appropriate levels of cognitive development. However, such an approach needs to be balanced with the strategy of maximizing class exposure to interventions and data collected on the same cohort given the design. For example, many IEQ studies are longitudinal, like Ghana and Guatemala in this study, and follow a cohort of children across multiple grades. In many of the countries in which IEQ does research, multi-grade classrooms and schools are frequent.

Gender

Research has shown that girls and boys can have very different experiences in the same classroom. Looking at the impact of factors on the performance of boys and girls separately can provide important information about classroom performance for all of the students. In both Guatemala and Ghana, classroom observation was conducted with a sub-sample of individual children made up equally of girls and boys. As such, it is possible to analyze separately the classroom environment experienced by both girls and boys and relate this to their performance. When observations are done at the level of the classroom, as in Uganda, it is not possible to capture whether the classroom experience differs for girls and boys.

b. Performance and Predictor Variables

The following categories of variables were chosen for carrying out the feasibility study.

- Pupil Performance
- School/Classroom data
- Teacher profile
- Pupil Profile
- Family/Community
- Instructional Methodology/Classroom Contexts
- Classroom Interactions
- Instructional Materials
- Language Use
- Health

For each variable, it was of interest to know, 1) whether the variable was available in each of the studies; 2) whether it could be analyzed at the level of the classroom; and 3) whether cross-national trends existed across the cases reviewed.

Pupil Performance

Within each country, pupil performance assessment instruments were developed as part of the research activity and related to the research questions of the study. In all three studies, curriculum-based assessment instruments were prepared. Uganda assessed math, reading and writing. Guatemala assessed reading, math, creativity, self-esteem and Spanish language proficiency in schools where the majority of pupils are indigenous. Ghana instruments assessed English language proficiency in terms of listening comprehension, reading comprehension, oral expression and written skills. It is of particularly importance that performance assessments capture like skills acquisition across countries as performance outcome is the proxy for quality education and is the dependent variable in this study.

School Profile

School profile variables include a large list of school factors such as the number of teachers by gender, the size of the school, the number of classrooms as well as the presence or not of a library, lunch program, latrine, electricity, drainage, drinking water and PTA as well as access to public transportation and roads. While all IEQ research incorporates school profiles, within the cases looked at in the feasibility study, there were few school characteristics quantified in databases that could be analyzed cross-nationally at the classroom level. Only researchers of the Uganda study provided a quantified database, so it must be assumed that data for the other countries exists in either raw or qualitative form.

Classroom Profile

Classroom variables which are often discussed in relation to education quality in the literature include class size, furniture, materials, display of pupil work, use of class time and use of class space. Again, few classroom variables were available in the databases. In fact, class size was the only classroom characteristics available in all country cases and analyzed for the purposes of this study.

Teacher Profile

Teacher variables associated with quality education often include the teacher's age, sex, qualification, years of teaching, years at school, knowledge of content and ability to relate content to local context. Similar to the school profile data, teacher information was collected in all three studies but only made available by the Uganda research team. For the two longitudinal studies, information on teachers was collected during the first year of the study and was not integrated into final research databases, reports and analysis.

Pupil Profile

The sole pupil characteristic that was numeric in nature and found universally in all databases was pupil age. Information such as pupil health, repetition rates, attendance

were not available across the studies. (Bring in Levinger, 1994 as to relevance of pupil characteristics)

Family/Community Profile

A growing literature on education quality places significant emphasis on the support for education within the family and community. In addition, family attributes including level of education of the head of household and of the mother, size of the family and economic situation of the family are often attributed to an individual pupil's access to and success in school. Unfortunately, family background characteristics were only reported by Uganda of the three cases reviewed.

Instructional Materials

Two basic variables relate to instructional materials and education quality – the number of materials and the use of the materials. All three countries observed the number and use of textbooks in the classroom.

Language Use

Language use in the classroom is an important policy concern in all three countries. In fact, it was the objective of the Ghana research. Ghana researchers identified ten separate language use variables measuring the use of English and Ghanaian local language by the pupils to the teacher, to other children in the classroom and in chorus. In Uganda, English use as the language of instruction in the classroom was observed and estimated as a percentage of class time. The Spanish language proficiency of pupils was assessed in Guatemala for the schools with majority indigenous populations but not used assessed in the feasibility study.

Interaction in the Classroom

The quality of classroom interaction is an important determinant associated with classroom quality. Ideally, it would be interesting to note how teachers behave towards girl and boy students in each country context. However, this data was not available. In Guatemala, the number of interactions in which positive or negative feedback was received by a pupil – from the teacher or other pupil was coded. In Uganda, the amount of praise and discipline by the teacher toward students in the classroom was measured. Uganda researchers also measured three additional classroom interaction variables: the proportion of interactions in class between teacher and girls, the proportion of interactions in class coded as “positive”, and the proportion of “positive” interaction with girls.

Instructional Methodology/Classroom Contexts

	GHANA	GUATEMALA	UGANDA
<i>Active Methodology</i>			
Small Group with teacher	Numeric: Percent time class engaged	Numeric: Number of interactions in which	
Small Group, w/o teacher			

Pair Work	in context	pupil was engaged	
Marking Papers at Pupil Desk, Small Group, Work with individual pupils, Demonstrating, Answering pupil questions			Nominal: Y/N for teacher use of methodology for at least 10 minutes during the observation
<i>Traditional Methodology</i>			
Large Group	Numeric: Percent time class engaged in context	Numeric: Number of pupil interaction in context	
Individual Desk Work			
Writing Notes, Marking Papers at Desk, Lecture, Group Recitation, Question and Answer			Nominal: Y/N for teacher use of the methodology for at least 10 minutes
Time spent opening/closing and transitioning classes	Numeric: Percent time class engaged in context	Numeric: Number of pupil interactions	

Finally, the instructional methodology used in the classroom significantly impacts the learning environment for pupils and pupil learning. Evaluating the teaching-learning process was integral to each of the country cases. To provide a sense of the importance of similar variable definition in performing cross-national analysis, I will provide a more in-depth synopsis of the feasibility analysis done on this variable.

In Uganda, researchers observed teachers' use of the following methods: lecture, writing notes/drawing diagrams, marking papers at teacher's desk, group recitation, question and answer, small group work, marking papers at pupils desk, demonstrating experiments, working with individual pupils, answering pupils questions. In Guatemala, classroom interactions were observed within five classroom contexts: small group led by teacher, small group led by students, large group (more than 8) led by teacher, individual student work at desk, pair work, and time spent opening/closing and transitioning between classes. In Ghana, researchers broke down class time into parallel contexts as Guatemala.

While each group of researchers looked at similar classroom methodologies, cross-national analysis was not straightforward. First, Uganda and Ghana collected classroom level data while Guatemala collected information in relation to observed pupils within the classroom. Second, each group of researchers measured the use of methodologies differently. For Uganda, nominal data was provided – either the activity occurred during the observation or not. In Ghana, the percent of time the class was engaged in the specific context during the observation was measured. In Guatemala, observers counted the number of interactions in which an observed pupil was engaged in each context. Since the total observation time was the same for each pupil, pupil interaction scores were aggregated for each classroom to create a proxy variables for the relative amount of time the class spends in given instructional methodology.

It was decided that cross-national analysis could be made if the data for each country was transformed into an active learning versus traditional learning paradigm.

Methodologies in each case were assigned to either active learning or traditional learning contexts and trends were compared cross-nationally.

c. Cross-National Trends

A correlational analysis of the data using the classroom as the level of analysis was performed for each country study. Correlations between variables were compared to assess whether similar significant relationships existed for the same variables in at least two of the countries. Three such cross-national trends emerged within the categories of variables: pupil age, classroom context and classroom interaction.

Pupil age

Correlation Matrix: Pupil Age and Having Textbooks

Context							
Ghana	.522*	.019	N=9	Boys:	.694*	.038	N = 9
Uganda	.400**	.001	N = 68	Urban:	.530**	.009	N = 23
Guatemala	NA			NA			

* p = .05; ** p = .01

In both Ghana and Uganda, there was a positive relationship between pupil age in the classroom and having textbooks. In Ghana, a strong, positive correlation was found for boys and in Uganda there was a weaker but highly significant positive relationship between pupil age and having textbooks. Older children having greater access to education materials makes sense in terms of the experiences in developing countries. Older children may have greater status or power within a classroom. In addition, parents may be more willing to invest in educational materials for their older children. The stronger relationship in urban areas of Uganda may be due to a greater availability of books in urban and, therefore, a greater variance of distribution in urban classrooms.

Teaching Approach

Correlation Matrix: Teaching Methodology and Student Performance

Context							
Ghana	.707*	.050	N = 8				
Uganda	-.602*	.018	N = 15	Math:	-.671**	.006	N = 15
Guatemala	.816**	.004	N = 10				

* p = .05; ** p = .01

Teaching methodology was found to be related to student performance in all three countries. However, the relationships differed across contexts. In Uganda the use of traditional contexts such as large group work in the classroom, as measured by the absence of diverse and active learning contexts, was correlated with P4 performance in rural classroom. While traditional contexts correlated with general performance, the correlation for math achievement was both of higher significance. In Ghana, large

group contexts was strongly and positively correlated with listening comprehension ability among pupils. Conversely, small group contexts, or active learning methodologies, were strongly related to improved academic performance among boys in Guatemala. The seemingly opposing trends in Uganda and Ghana as compared to Guatemala may be a manifestation of both the emphasis of instructional context and the assessments used to measure pupil performance in each study. The Uganda relationship makes sense in the context of a baseline study in which teacher training interventions have not emphasized active learning classrooms and pupil performance assessments reflect the traditional methods in use. Similarly, listening comprehension is a measure of the passive learning that takes place in large group contexts typified by a teacher lecturing in front of a classroom. As such, traditional contexts are positively correlated with traditional performance measures. On the other hand, curriculum-based performance measures in Guatemala were developed to test pupil performance in active learning classrooms. Thus, a positive relationship between small group contexts and pupil performance would be the expected result.

Classroom Interaction

Correlation Matrix: Teaching Context and Quality of Interaction in the Classroom

Context				
Ghana	NA			
Uganda	Praise toward student	.376**	.002	N = 68
Guatemala	Positive interactions	.466*	.038	N = 20
	Negative interactions	.622**	.003	N = 20
	Student Initiated with teacher	.817**	.000	N = 20

* p = .05; ** p = .01

Positive and negative reinforcement toward pupils in the classroom was related to teaching approach in both studies where reinforcement was measured, Uganda and Guatemala. Active teaching methodologies in Uganda were significantly, positively correlated with praise toward students. As teaching approaches relied more heavily on small group work, demonstrating and working with individual students, teachers provided increased amounts of praise to students in the classroom. A similar trend was found in the NEU schools in Guatemala where small group work was correlated with receiving greater amounts of both positive and negative reinforcement and with increased student initiated interactions with the teacher. These trends make sense across both contexts. Small group work increases the opportunities in a classroom for interaction between pupils and their teacher and classmates. Increased interaction may take the form of positive or negative reinforcement as well opportunities for student-initiated involvement.

d. Conclusions of Feasibility Study

IEQ is supporting similar research initiatives in several countries based on similar theoretical constructs. Each country conducted research to understand the factors within the classroom that improve quality learning in the primary school setting.

Variables collected in each study represented eight categories often discussed in the literature as important to studies of school effectiveness.

Research techniques and strategies were local to each study and the classroom observation practices, research instruments and data measures that emerged from each disparate. Moreover, data sets for each study were incomplete. Few independent variables on learning quality were the same for each study and ready for cross-national comparison.

There was considerably less space for cross-national analysis than was originally hypothesized and few cross-national trends were found within the parameters of the correlational analysis. However, the several consistent trends found cross-nationally in the data make further manipulation of the IEQ1 databases worthwhile.

A consistent effort with each project collecting a set of core data using similar instruments would promote IEQ ability to conduct a rigorous cross-national study with ongoing projects.

e. Implication

The conclusions of this feasibility study lead to two distinct courses with multiple options. of implications for conducting cross-national analysis of IEQ data: 1) cross-national analysis of current data sets; and 2) standardization of ongoing IEQ research practices.

- It is possible to investigate further several areas of inquiry based on the current case studies, especially as the current data sets are completed and clarified. Other than correlational studies, trend analysis, meta-analysis,

In addition, the first stages of IEQII data for Malawi and Guatemala has been collected and analyzed and new studies in Ghana and Honduras are expected. IEQII Malawi is conducting research with a sample of 65 schools focusing data collection on language use, gender, teachers and classroom observation. In Guatemala, IEQII researchers have collected baseline data for a sample of 55 schools to examine the implementation of bilingual education. Guatemala IEQ II data sets include variables on language use as well as comprehensive data on family, teacher and pupil backgrounds, classroom observations and gender. Both these studies provide larger sample sizes than the IEQ1 studies that will greatly facilitate statistical analysis. However, as with IEQ1 data, the country researchers are not analyzing their findings at the classroom level.

The IEQ technical approach is based on working as colleagues with local research teams in designing and implementing research that reflects national educational priorities and reveals the local realities of schools and classrooms. However, assisting local teams to meet international education research standards is an important aspect of building local research capacity. Rigorous cross-national study would be promoted by a somewhat greater standardization of data collection. If IEQ researchers at the core and in participating countries find it worthwhile to be able to compare research findings

across countries, a core set of data using similar instruments would need to exist. Although many questions will be specific to individual countries, a core set of design and sample questions and procedures would need to be established. These could include:

- A set of core variables measured consistently across countries;
- Legible codebooks, labeled databases and explicit account of assumptions used in collecting and coding the variables; and
- Procedures and measures that allow for information to be disaggregated by class and gender. Individual pupils nested within classrooms provides the greatest flexibility for cross-national comparison;
- A minimum number of cases within each sample (e.g. treatment, grade) group is obtained for statistical purposes, i.e. 10 classrooms. For example, where the experience of language minority students is of importance select a sufficient number of cases (classrooms) to be able to examine the data statistically;
- Even where the design calls for multiple grade levels to be studied, IEQ may want to ensure focus on one grade for cross-national analysis, perhaps third or fourth grade. Third is usually viewed as the last year of “early cycle” and fourth grade is generally seen as where functional literacy is achieved; and
- Performance measures that capture treatment outcomes.

III. Concluding Remarks

Cross-national analysis has the capacity to promote international knowledge of factors that impact quality learning in the classroom. In terms of IEQ research, cross-national analysis can promote new strategies for cross-national learning and sharing of research designs, instruments and practices across research teams.