Improving School Quality in East Africa:
Randomized Evaluation of Policies to Create Local Accountability under Free Primary Education in Kenya and Uganda

Short Abstract
During the last decade, both Kenya and Uganda have introduced free primary education (FPE). While FPE has succeeded in increasing the quantity of children enrolled in school – dramatically so in Uganda – there is widespread concern that school quality has suffered. There are two primary explanations for this decline: the failure of school budgets and staffing levels to keep pace with enrolment; and the loss of local accountability as school management and funding has become centralized. We propose to conduct a randomized impact evaluation of two interventions designed to address these issues: co-funding of community-hired contract teachers and establishment of a Community-Based Monitoring System organized by the school management committee. This project will be implemented in collaboration with the Ministry of Education in each country, ensuring scalability while simultaneously building in-house capacity for impact evaluation in the ministries.

A. Aims and objectives (1.5 pages)
A.a. Study overview
This application proposes a randomized controlled trial of institutional interventions in the Kenyan and Ugandan primary education sector, with the aim of empowering local institutions to improve school quality. This project will take place in close collaboration with the Ministries of Education (MoE) in both countries in an effort to offer a learning-by-doing approach to make evidence-based policy making a central feature of the Kenyan and Ugandan educational framework.

The project proposes to build on – and fill in gaps in – work done under the policy of free primary education (FPE) in Kenya and Uganda. In Uganda, the combination of the abolition of school fees and the near doubling of education spending as a share of the budget have brought some impressive accomplishments: the number of primary schools and teachers both increased
by more than 70% in the first 7 years of FPE, with a 73% increase in gross enrollment ratios in
the first year alone. However, questions of quality persist. The remaining problem is evidenced
by low primary completion rates; of the 2,159,850 pupils enrolled in primary one at the time of
FPE introduction in 1997, only 22.5% reached primary seven in 2003. The common inability of
parents’ associations to raise funds for school meals provides a partial explanation for poor
attendance and low performance of enrolled pupils. Pupil/teacher ratios of 54:1 and
pupil/classroom ratios of 94:1 as of 2003 had not risen to meet goals of 40:1 for these indicators.
Understaffing and under-training of teachers are exacerbated by absenteeism.

In Kenya, increases in enrolment have been more modest, rising by approximately 19%
from 2002 to 2004. However, even this relatively modest increase – in combination with a hiring
freeze on new teachers implemented prior to FPE – has contributed to a severe teacher shortage in
Kenyan classrooms yielding a pupil-teacher ratio of approximately 50:1. Additionally, the shift
to a top-down funding system – replacing Kenya’s previous system of community fundraising
built around *harambees* – has led to a decline in parental involvement in school management.

The research program will focus on two key interventions aimed at improving learning
achievements in primary schools. The first is to provide a mechanism that assists communities to
raise funds to address shortages of educational inputs according to their needs: hiring local
contract teachers to address the shortage of centrally-hired teachers in Kenya, and funding locally
determined projects in Uganda. The second is a Community-Based Monitoring System (CBMS)
which provides a tool for parents and School Management Committees (SMC) to evaluate their
school’s performance and hold teachers and head teachers accountable. These two interventions
correspond to the two challenges in implementing FPE identified above – input shortages and
lack of parental ownership.

The evaluation will be based on a randomized controlled trial involving an experimental
group of approximately 196 schools Kenya and 100 schools in Uganda spanning multiple
districts, to be conducted as follows. The study will employ a “cross-cutting” design, in which a
subset of schools participates in either one, both, or neither intervention. The study will measure impacts by comparing differences across groups in outcomes of student and institutional performance before the intervention and 9-12 months after the start of the intervention.

A.b. Main research questions and core research objectives

The underlying premise of this research project is that the expansion of the primary education sector under FPE has (a) led to an influx of new students creating an acute shortage of teachers, (b) undermined the ability of schools to raise funding locally due to the abolition of fees – in some cases leaving schools worse off than prior to FPE – and (c) weakened community based monitoring of schools. This weakening of local monitoring appears to be linked to the abolition of fees. As parents no longer control the purse strings of the school, their incentive to monitor school performance has diminished.

The tension between the need for additional, external funds in the Kenyan and Ugandan education system, and the potential for outside funding to undermine local ownership of schools is at the center of this research project. The main question posed in this project is whether local accountability requires local fundraising, or whether merely strengthening community-based monitoring systems is sufficient. In so doing, the project will assess whether matching funds programs can provide sufficient incentives to allow local fundraising, even when parents and schools can not use the threat of exclusion as an enforcement device.

The primary objective of the project is to identify policies to improve the quality of education in Kenyan and Ugandan primary schools. The national scope of the project in each country, as well as close collaboration with the respective Ministries of Education, will ensure maximum potential for scalability. Further, conducting a comparable intervention in diverse districts and across countries will allow us to examine the extent of external validity problems. A secondary objective is to create a unit within the Directorate of Quality Assurance and Standards in Kenya and in the office of the Commissioner for Education Planning in Uganda that will be able to rigorously evaluate future policy innovations.
B. Methods (7.5 pages)
B.a. General description of the intervention, population to be studied, outcomes of interest, timing of effects, existing data and/or data to be collected, methods to be used to analyze data.

General description of the intervention. The research program in each country will focus on two key interventions. In Kenya, we are working in collaboration with the Basic Education Directorate of the Kenyan MoE to formulate these two new programs to improve learning achievements in primary schools. The first is to assist communities in hiring local contract teachers to address the shortage of centrally-hired teachers from the national Teacher Service Commission. The second is a Community-Based Monitoring System (CBMS) which provides a tool for parents and School Management Committees (SMC) to evaluate their school’s performance and hold teachers and head teachers accountable. In Uganda, firstly, offers of matching funds will be made to a set of treatment schools, applicable toward the provision of school lunches or toward other needs selected by the SMC. As in Kenya, the second intervention will implement a CBMS. Both are being refined in consultation with the Commissioner for Education Planning and with district education officers. These two interventions correspond to the two challenges in implementing FPE identified above – shortages of key educational inputs and lack of parental ownership.

Population to be studied. The objective is to sample both treatment and control schools from a large number of districts representing a variety of agro-climatic, socio-economic and political contexts. The Kenyan sample will build on the sampling frame established by the third round of the Southern and Eastern African Consortium for Monitoring Education Quality survey (SACMEQ) which was conducted in 2007 and spanned 196 schools in 57 districts covering all 8 provinces of Kenya, with a total of 3,299 students. The Ugandan sample will be representative of rural primary school students in four districts, one in each region of Uganda: Hoima (West), Kiboga (Central), Apac (Northern), and Iganga (Eastern). The sample will be drawn using
primary data already collected, which enumerate all primary schools in rural sub-counties and allow stratification by 2006 enrollment and performance.

**Outcomes of interest.** The primary outcome of interest is student achievement, as measured by performance on national exams as well as custom-made literacy and numeracy exams to be developed in collaboration with the Kenya Institute of Education (KIE), charged with formulating the national curriculum, and the Commissioner for Education Planning and District Education Officers in Uganda. A secondary outcome of interest is the change in enrolment and transition to secondary school over the intervention period in treatment versus control schools.

**Timing of Effects.** For the primary outcome – exam performance – the impacts of the interventions should be observed at the end of the academic year. Impacts of both the CMBS and the co-financing intervention should continue for subsequent cohorts, contingent on continued funding of the programs. Subsequent survey work will assess whether effects diminish over time.

**Data to be used/colllected.** Our research team has already received approval from the Kenyan Minister and Permanent Secretary of Education and Minister of Planning to access a variety of administrative data sources including: the Education Management Information System (EMIS); Kenya Certificate of Primary Education (KCPE) exam data; DQAS Panel Inspections reports; Southern and Eastern African Consortium to Monitor Education Quality (SACMEQ) II and III; the Kenya Integrated Household Budget Survey (KIHBS). We will also collaborate in design and implementation of the National Assessment System to Monitor Learning Achievements (NASMLA). District Education Officers in Uganda have agreed to provide Primary Leaving Examination results and administrative data on school funding and district-level inputs. These will be complemented in Uganda by school-level outcome data collected by EPRC researchers in collaboration with District Inspectors of Schools.

**Methods for data analysis.** The basic methodology will be a difference-in-differences model exploiting the randomized design of the intervention. In simplest form, this approach compares mean changes in academic performance between treatment and control schools.
Each project will implement two interventions. The first intervention will assist communities in fundraising to address specific needs. In Kenya, this will be applied to hiring local contract teachers to address the shortage of centrally-hired teachers from the national Teacher Service Commission (TSC). Currently, some schools with an insufficient number of TSC teachers manage to raise funds locally on the initiative of the SMC. For a variety of reasons – socio-economic status of the community, poor school management – many schools fail to fill teacher vacancies via this route and have empty classrooms. In Uganda, matching funds may be applied to community-driven school projects, where qualitative interviews at school level in target districts suggest that the greatest demand is for school lunches. By offering partial funding for these initiatives from the Ministry and requiring local co-funding, the intervention attempts to design a mechanism which delivers external funds without undermining local accountability. Because local communities provide co-funding it is hoped that they will take greater ownership of school management. In Kenya, we can test this hypothesis explicitly by using two levels of assistance: full-funding of contract teachers by the MoE versus partial funding with an element of local co-funding. In Uganda, this can be tested by examining interaction effects with the second intervention, described below.

The second intervention is a Community-Based Monitoring System (CBMS) which provides a tool for parents and School Management Committees to evaluate their school’s performance and hold teachers and head teachers accountable. The proposed CBMS system is based on a school scorecard, to be completed by parents through the coordination of the SMC. A workshop is currently being planned in Nairobi to train District Education Officers (DEO) from around Kenya in the principles of CBMS, who will then be charged with training SMC members in use of the scorecards. In Uganda, DEOs and District Inspectors of Schools in the four study
districts will be trained in CBMS directly by the Ministry of Education and EPRC, and then will similarly train SMC members in their use.

B.b.ii.  How will this work
B.b.ii.1  Who are the beneficiaries?

The primary beneficiaries will be primary-school age children in the catchment area of the treatment schools.

B.b.ii.2.  How will they benefit?

The main benefit will accrue via improved learning outcomes and better quality of education delivery. This should result in more children graduating from school with better test scores, lower dropout rates, higher transition rates to secondary school and the necessary skills to compete successfully in the labor market.

B.b.ii.3.  How do you draw the control group to which you compare the treated group?

Control schools will be chosen randomly and simultaneously with the treatment. Successful randomization will be tested along the following dimensions prior to the interventions: school size, class size, teacher qualification and pre-intervention test scores. In Kenya, the SACMEQ sample stratification will ensure that the treatment and control schools have equal representation from the urban and rural areas in each province. In Uganda, the sample will be drawn from primary data collected at district level. Schools will be drawn to be representative of rural sub-counties, with ‘blocking’ of the sample based on pre-intervention test results to ensure representation of low-performing (typically remote) schools.

The impact evaluation will use a “cross-cutting” design, in which the treatment group for each intervention is assigned orthogonally: half of the schools are offered co-funding for contract teachers; half the schools participate in the CBMS intervention; one-quarter participate in both, and one-quarter participate in neither.

B.b.iii.  Who will do it?
All the experimental interventions will be conducted with the Ministry of Education and implemented by Ministry staff. In Kenya, we are working with the directorate of Quality Assurance and Standards and the Directorate of Basic Education. The DQAS is in charge of all the data collection and DBE will organize the actual interventions. In Uganda, we are working with the Commissioner for Education Planning and with the District Education Officers in the four districts to carry out the intervention. Our research team will collaborate in the design of the interventions, data collection and supervision in the field.

B.b.iv. What potential problems do you foresee and how will you overcome these?

Working with the Ministry of Education provides enormous scope for scaling up but also brings risks in terms of political uncertainty and bureaucratic inflexibility. Specifically, given the approaching Kenyan elections, it is unclear that the commitments to collaborate made by the Minister and PS will carry over to a new administration. To address this we are working hard to make as many contacts as possible with mid-level administration in the MoE prior to the elections, as these officers will remain in place regardless of the outcome of the election. Equally, we have scheduled additional time in January and February to renew our contacts and secure commitment at the highest level should the election result in a change of government.

A general concern with any kind of intervention must be dealt with here. To ensure compliance in the treatment schools, we will work closely with Ministry staff and embed the implementation and supervision of the interventions in the established monitoring systems of the respective ministries and districts, which we believe should go a long way towards ensuring compliance.

B.c. Data collection methods (experimental projects only)

B.c.i. Will a baseline data be collected or will you use existing data for the baseline?

In Kenya, our research team has already received approval from the Minister of Education and Minister of Planning, as well as the Permanent Secretary in the MoE, to access a variety of administrative data sources including:
• Education Management Information System (EMIS): the EMIS database contains information on enrolment, achievement, staffing, absenteeism, etc., collected by the District Education Offices (DEO) at the end of each term for every school in the country.

• Kenya Certificate of Primary Education (KCPE) exam: the database of KCPE exam scores administered by the Kenya National Examinations Council (KNEC) contains scores for every school in the country, disaggregated by gender and age group.

• Panel Inspections: the Directorate of Quality Assurance and Standards periodically conducts detailed inspections of the management of all schools in Kenya, including the conduct of the School Management Committee.

• SACMEQ: this database combines pupil exam scores in literacy and numeracy with detailed data on school resources, teacher characteristics and students’ socioeconomic backgrounds. This data will serve as part of our baseline for the evaluation. For subsequent data collection we will return to the same schools to create a panel of schools.

• Kenya Integrated Household Budget Survey (KIHBS): the KIHBS is a comprehensive household socio-economic survey covering all districts of Kenya.

In Uganda, administrative data available from District Education Officers district (already collected for two of four proposed treatment districts) provide school-level data on Primary Leaving Examinations, teachers, classrooms, and enrollment. These will provide the basis for sample selection and additional controls for the analysis. Additional baseline survey data will be collected to provide characteristics of communities, schools, and SMCs.

B.c.ii. What population will be studied

The sample will represent the population of students in government-funded primary schools in all provinces of Kenya, and the population of students in rural government-funded schools in four poorly performing districts, spanning all regions of Uganda.

B.c.iii. Sampling design, sample size and statistical power
In Kenya, following the SACMEQ, our sample will be stratified along two dimensions: provinces and rural/urban location. As stated in section (B.a), the SACMEQ survey – which will constitute the baseline for our study – used these two stratifications to randomly sample 196 schools in 57 districts covering all 8 provinces of Kenya. All follow-up testing in the SACMEQ schools will include at least 20 students per school.

Based on previous studies, the SACMEQ research team calculated minimum sample sizes using an intra-school correlation coefficient of 0.4 for academic achievement. Assuming a minimum class size of 20 pupils, this implied that at least 172 schools were required in order to provide 95 percent confidence limits of ±0.1 standard deviations in the school mean of pupil achievement.

In Uganda, a two-tiered selection procedure will be used, first to select treatment and control sub-counties and then to select study schools within each sub-county. 100 schools will be chosen in total, balanced across regions and – within regions – across the four study groups: pure control, CBMS only, co-funding only, and both interventions. Comparable survey instruments to pool the analysis across countries and expansion of treatment schools in a second year will strengthen statistical power.

B.c.iv. Key data to be collected (and how this will be done)

In addition to the existing administrative data sources which will constitute the primary baseline in Kenya, the MoE has also agreed to collaborate with our research team in the design of the upcoming NASMLA. This will provide an opportunity to administer additional numeracy and literacy tests, covering students in lower grades, which will be repeated as part of a post-intervention follow-up survey. Original baseline data on communities (including demographics, access to services, and proxies for income), schools, and SMC characteristics (demographics and pre-intervention activity levels) will be collected in Uganda by EPRC-supervised research teams.

B.d. Modeling and testing

B.d.i. What model/idea will you test with these methods
The central hypotheses that the research program aims to test are:

1. Hiring additional contract teachers in Kenya will have a significant effect on student learning achievements. This may act simply by lowering teacher-pupil ratios or by changing the nature of the contract.

2. Providing school lunches or meeting other input shortages in Uganda will have a significant effect on student attendance and learning.

3. Giving parents a financial stake in the school (soliciting co-funding to hire contract teachers) will increase local accountability and community monitoring relative to pure top-down funding.

4. Informing school management committees of parents’ rights and teachers’ responsibilities and providing them with tools to monitor school performance will improve school management and student performance.

5. Community-based monitoring systems are particularly effective when parents have a financial stake in the school – i.e., there are complementarities between the interventions.

B.d.ii. What empirical methods will you use to do this testing

The basic framework for impact evaluation will be a difference-in-differences model exploiting the randomized design of the intervention. In its simplest form, this approach compares the mean change in academic performance between treatment and control schools. We are also interested in the impact of the interventions on specific subpopulations of students within the school – e.g., boys and girls, high and low performers on the baseline exam, etc. – and subsets of schools – e.g., rural and urban, high and low socioeconomic status, high and low class size, etc. These will be estimated by interacting the treatment with the de-meaned measure of the dimension of interest.
The cross-cutting sample design will also allow us to test for complementarities between the two interventions by comparing schools that have received both interventions to those receiving only one or the other.

**B.d.iii. What empirical problems do you foresee**

There are inherent challenges in using impact estimates from a pilot study to predict the impact of a nation-wide program which, if successful and scaled up, would target all schools. During the pilot, it is possible that the additional resources spent on treatment schools will attract students from nearby control schools. The direction of the bias introduced from this endogenous school switching is somewhat ambiguous ex ante. On the one hand the influx of students will to some extent undo the reduction in class-size achieved by hiring a contract teacher, thereby underestimating impact of a nationwide program. On the other hand, if these new students are above average in motivation – as evinced by their willingness to travel to a better-financed school – they may bias the estimate treatment effects upward. We can partially overcome this bias by restricting the sample to students enrolled pre-intervention when estimating impacts. However, if the new, above average students have positive peer effects on the originally designated treatment group, the upward bias will remain. Finally, one way to test whether this bias is important, is to compare control schools in the vicinity of treatment schools with a broader cross-section of schools that do not receive treatment (e.g., the population of all schools and test scores from the EMIS database). If this sorting bias matters, proximate control schools should experience a negative externality from the program and under-perform relative to the national average. To address a specific contamination concern that arises from implementing the intervention in conjunction with sub-county governments, treatment and control schools will be clustered within a number of distinct sub-counties.

**B.e. Human subjects concerns**

**B.e.i.** Any ethical, social, gender or environmental issues or risks which should be noted
Currently, schools in Uganda have typically ceased raising funds for lunches and other services in the absence of student exclusion as an enforcement mechanism, while schools which hire local contract teachers in Kenya raise funds through allegedly voluntary contributions from the parents in the school. Formally, under FPE no head teacher may turn away any student from a primary school. However, there is anecdotal evidence that all parents are expected to contribute in order to enroll their children. While these contributions are only a small fraction of the fees charged prior to FPE, they may nevertheless constitute an obstacle to enrolment for some extremely poor households.

Given this context, there is a potential concern that schools which receive partial funding for a contract teacher will be encouraged to demand additional contributions from all parents – potentially discouraging enrolment in some cases. To overcome this risk, it will be of paramount importance that the intervention is accompanied by clear guidance on guaranteeing unrestricted access to primary school and close monitoring from the Zonal Quality Assurance Officer in Kenya, and the District Inspector of Schools in Uganda, to ensure that the principles of FPE are upheld.

**B.e.ii. Explanation of how project will comply with requirements of local ethics review boards (e.g., how will you do informed consent; how will you ensure that no one comes to any harm; how will you ensure confidentiality etc…)**

There are two levels of informed consent that will be relevant for this project: consent to treatment, and consent to participate in the survey and examinations. Consent to treatment will be solicited at the school and community level through group meetings with the school management committee and the head teacher. In the case of the contract teacher intervention, any agreement to provide co-funding would require approval of the community at large. Such community meetings are periodically convened by the SMC to take such decisions.
Regarding consent to participate in the survey and examinations, all data collection under the project will be done as part of the MoE’s and districts’ regular monitoring systems and is therefore governed by the legal reporting requirements of schools.

As far as ensuring that no one comes to any harm, the interventions themselves present no downside risk to the affected students. Unlike a clinical drug trial with the risk of adverse side effects or complications, this project will simply add resources to the school’s budget and train SMC members in new skills.

The final data sets for analysis will ensure the complete confidentiality of all students, teachers and SMC members. Each individual will be assigned a unique identifier that can only be linked to their name by MoE staff.

C. The study team (1 page)
C.a. Principal investigator; brief bio and explanation as to why they are well suited to lead this project.

Co-Principal Investigator, Kenya: Dr. Germano Mwabu is Professor of Economics at the University of Nairobi. Previously he has held teaching or research positions at Yale University, Cornell University and the United Nations University (WIDER), and has been an active organizer of the African Economic Research Consortium (AERC). He has published more than three dozen refereed journal articles and edited three books. In working with the Ministry of Education, he also has access to a wide network of former students and supervisees now in the civil service.

Co-Principal Investigator, Uganda: Mr. Lawrence Bategeka is a Research Fellow at the Economic and Policy Research Consortium (EPRC) in Kampala, Uganda. Prior to his research career Mr. Bategeka was a school teacher and headmaster in the Uganda school system.

C.b. Other key research staff and their roles. List indicating age (or if they are under 30), sex, prior training and experience in the issues for each of the team members.

Mrs. Racheal Nakhumicha Musitia (female, age 34) is a former secondary school teacher, now pursuing a Master’s degree in economics at the University of Nairobi. Given her experience
in Stata and various database management programs, she will play a key role in the analysis of administrative data from the MoE.

Ms. Mumia Phyllis Machio (female, age 24) is also Master’s student in the School of Economics at the University of Nairobi. She intends to pursue a Ph.d. in Economics, for which participation in this study will be directly applicable.

Ms. Alice Muthoni Ng’ang’a (female, age 26) is a lecturer at Strathmore College and is simultaneously pursuing a Master’s degree in Economics at the University of Nairobi. She is also a fully qualified accountant.

**C.c. Collaborators/consortium arrangements**

**C.c.i. Are there collaborators involved?**

The main collaborator is the Ministry of Education in Kenya, and the Ministry of Education in Uganda (along with the four district education offices). The research team is also working closely with Prof. Mwangi Kimenyi who divides his time between the University of Connecticut and research work in Nairobi. The research team also receives some assistance from junior researchers based at the Centre for the Study of African Economies (CSAE), University of Oxford – Tessa Bold, Justin Sandefur and Andrew Zeitlin.

**C.c.ii. Who does what?**

The MoEs will have primary responsibility for implementing the intervention, collecting the data and monitoring compliance. The costs of implementing and evaluating the intervention will be financed by the research project. Prof. Kimenyi has been involved in the design of the research agenda and has facilitated contacts with all the major stakeholders in Kenya. The Oxford collaborators will provide field support during project implementation as well as some technical assistance in the analysis of the project data.

**C.c.iii. How will you resolve disputes?**

The project aims to prevent disputes by agreeing clear budgetary allocations. The research budget will be divided equally between the two applying institutions, University of Nairobi and EPRC.
The research budget will be used to fund the interventions and research costs of the participating researchers at each institution. The Ministries will not be asked to fund any project activities over and above their normal operations (see also section B.b.iv on how we aim to address potential problems in the collaboration with the Ministry). Both Professor Kimenyi and the Oxford collaborators are independently funded by their home institutions. In terms of research collaboration, it is worthwhile to point out that Professor Kimenyi and Professor Mwabu have a long-standing relationship via the African Economic Research Consortium. EPRC, CSAE and the University of Nairobi have worked together as partners in the DFID-funded research consortium on Institutions for Pro-Poor Growth.

C.d. Past, current or pending projects in related areas involving team members: list with name of funding institution, title of project, list of team members involved.

Professor Mwabu and Mr. Bategeka are part of a consortium funded by DfID, “Improving institutions for pro-poor growth”, directed by Paul Collier. This consortium involves researchers from specific institutions in six developing countries, CSAE and Oxford. Other collaborators from CSAE are Stefan Dercon, Tessa Bold, Justin Sandefur, Roxana Gutierrez and Andrew Zeitlin. Via the DFID-funded research consortium, Professor Kimenyi and Professor Mwabu, together with collaborators at CSAE, have been able to provide the ground work for some of the work proposed in this proposal, including in terms of offering basic capacity building on the principles of randomized evaluation. CSAE will be able to fund any assistance to the project provided by its staff but funding for the actual intervention is currently not available, justifying this proposal.