EdData II

The Primary Math and Reading (PRIMR) Initiative

Information and Communication Technology (ICT) Intervention: Baseline Analysis Report

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The Primary Math and Reading (PRIMR) Initiative

Information and Communication Technology (ICT) Intervention: Baseline Analysis Report

Prepared for
Dr. Teresiah Gathenya, Contracting Officer's Representative (COR),
United States Agency for International Development (USAID)/Kenya

Prepared by

Dr. Benjamin Piper, Dunston Kwayumba, and Dr. Abel Mugenda
RTI International
3040 Cornwallis Road
Post Office Box 12194
Research Triangle Park, North Carolina 27709-2194
USA

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Abbreviations

EGMA	Early Grade Mathematics Assessment
EGRA	Early Grade Reading Assessment
ICT	information and communication technology
KESSP	Kenya Education Sector Support Programme
KNEC	Kenya National Examinations Council
LOI	language of instruction
MOE	Ministry of Education
NESSP	National Education Sector Support Programme (pending follow-on to KESSP)
NF	nonformal
pm	per minute
PRIMR	Primary Math and Reading Initiative
PTA	parent-teacher association
RTI	RTI International (trade name of Research Triangle Institute)
SMC	school management committee
SSME	Snapshot of School Management Effectiveness
TAC	Teachers' Advisory Centre
TIVET	Technical/Industrial Vocational Education and Training
USAID	United States Agency for International Development
wpm	words per minute

Executive Summary

Introduction

The Primary Math and Reading (PRIMR) Initiative is a collaboration between the Ministry of Education (MOE) and USAID/Kenya. One component of PRIMR is the Kisumu information and communication technology (ICT) study. The Kisumu ICT study is a randomized control trial of ICT-based literacy initiatives that began in January 2013. The intervention is being implemented in 80 government schools in Kisumu County.

The treatment groups were assigned to three subgroups of two zones (one rural and one urban) carrying out different ICT interventions, as follows: (1) The first subgroup is using electronic tablets to bolster the Teachers' Advisory Centre (TAC) Tutor instructional support system through TAC tutors supporting 20 schools, 10 each in Bolo and Ragumo zones. (2) In the second subgroup, teachers are using enhanced teachers' guides on tablets, specially fitted with PRIMR instructional materials, as well as specially designed classroom pedagogical supports, including virtual flashcards, additional reading materials, and the RTI-developed continuous-assessment software called Tangerine:Class™. This treatment is being implemented in 20 schools—10 each in Barkorwa and Nyabondo zones. (3) The third subgroup of schools is using e-readers to help pupils practice their reading skills. Again this is being implemented in 20 schools—10 each in Kodingo and Bolo zones. Finally, 20 schools (10 in Ahero zone and 10 in Chulaimbo zone) are serving as the control schools in 2013, but will have intervention support in 2014. The intervention selected for the control schools will depend on which of the three treatments is most effective.

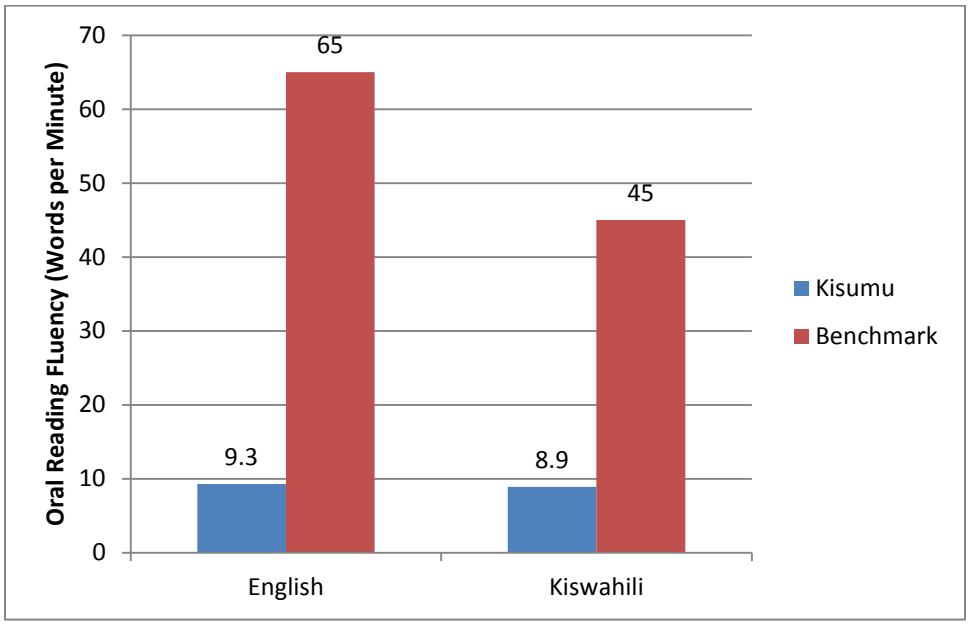
Kisumu ICT Baseline Data Collection

Data collection for the baseline was undertaken in January 2013. The major objective of the baseline was to establish the baseline reading outcomes of Class 2 pupils in Kisumu County in English and Kiswahili. We were also interested in assessing the availability and usage of ICT tools in teaching and learning in the county to give us some background data on whether and how teachers and head teachers were capable of employing ICT. Instruments tailored specifically for this effort (see ***Annex A*** of this report) were used to collect data from 1,580 pupils, 108 teachers, and 80 head teachers in the eight zones.

Early Grade Reading Assessment (EGRA) Findings

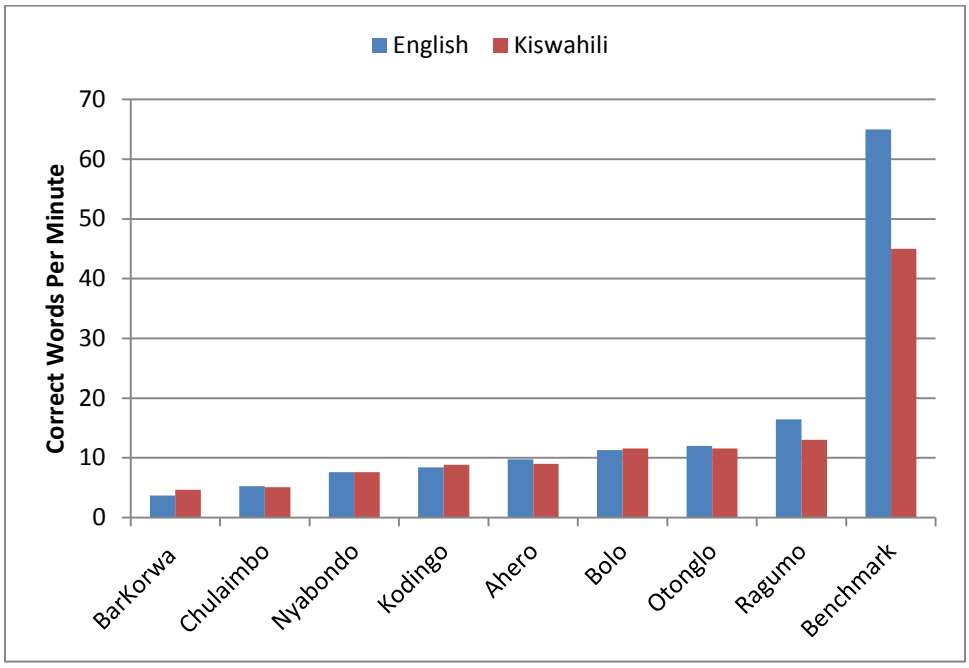
The Kisumu baseline data showed that reading outcomes were very low for both English and Kiswahili when compared with the reading benchmarks for oral reading fluency and comprehension set by the Ministry of Education and KNEC in August 2012, as shown in ***Figure 1*** below. English oral reading fluency was 9.3 words per minute, and Kiswahili fluency rates were very similar (8.9 wpm).

Figure 1: Kisumu County Class 2 oral reading fluency rates in English and Kiswahili compared to Kenya benchmark rates for Class 2



When disaggregated by zone, the data showed some variation in pupil achievement by zone ***(Figure 2).*** Oral reading fluency rates were lowest in Barkorwa and Chulaimbo zones, and highest in Otonglo and Ragumo zones. All zones remained very far from the benchmarks set for Class 1 and 2, with the mean scores in none of the eight zones assessed reaching halfway to the benchmark on average.

Figure 2: Kisumu County Class 2 oral reading fluency rates in English and Kiswahili disaggregated by zone and compared to benchmark rates

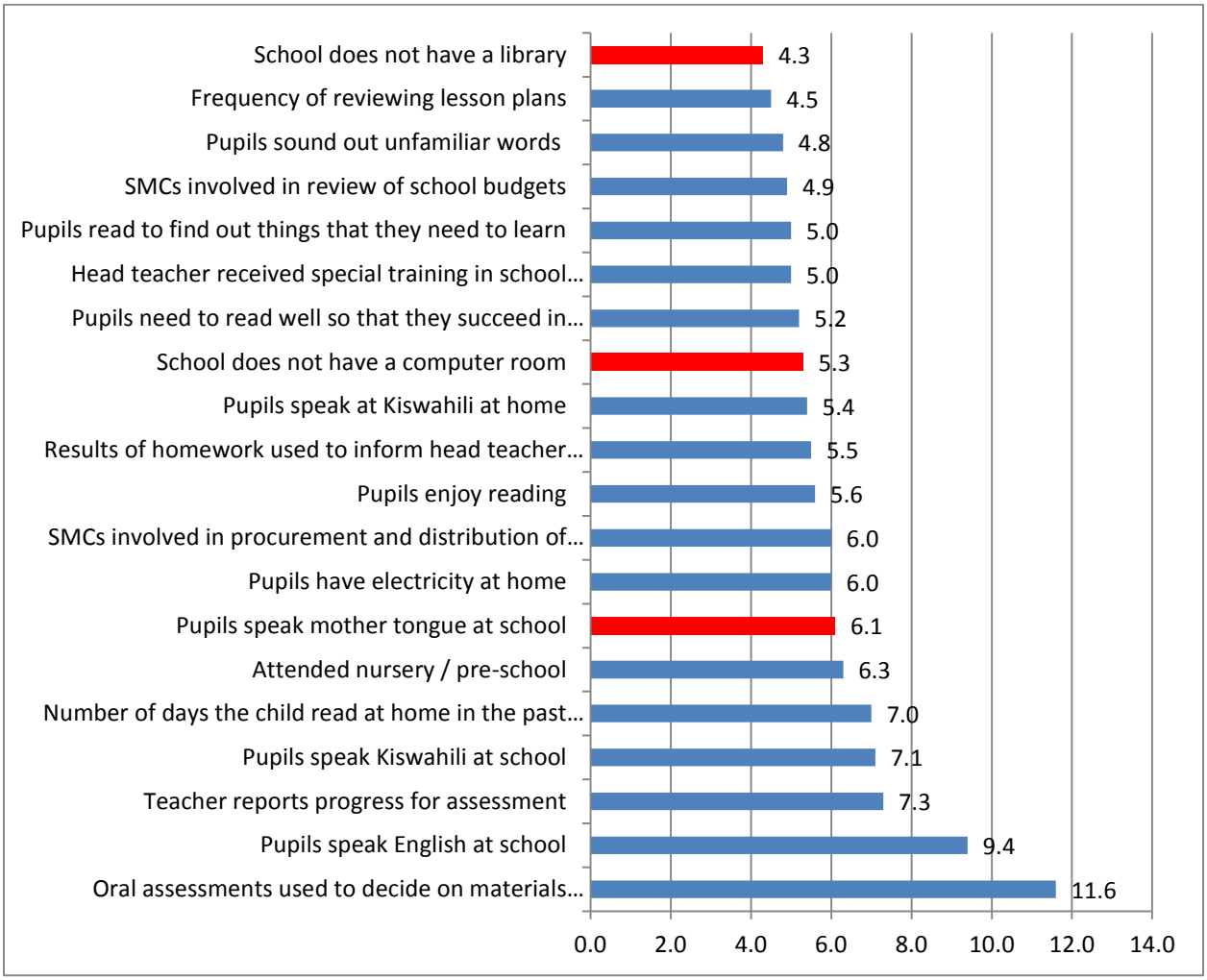


Reading Predictors

The Kisumu ICT baseline also examined pupil, school, and classroom factors that were related to learning outcomes. ***Figure 3*** below shows the word-per-minute (wpm) correlations between predictors and English fluency. [1] The red bars indicate areas where the predictor had a negative relationship with English fluency rates. For example, fluency rates were 4.3 wpm lower if the school did not have a library, 5.3 wpm lower if the school lacked a computer room, and 6.1 wpm lower where pupils spoke in their mother tongue while at school. On the other hand, blue bars indicate areas where the predictor had a positive relationship with English fluency. For example, pupils read 11.6 wpm more fluently when oral assessments results were used to decide on teaching materials, 7.0 wpm more fluently when children said they read at home for at least one day in a week, and 6.0 wpm more fluently for pupils residing in homes with electricity.

[1] English fluency was chosen as the basis for comparison because it had slightly more variation against the predictors.

Figure 3: Significant predictors for pupil outcomes, English EGRA



Recommendations

The Kisumu ICT baseline findings generated several recommendations for the Kisumu County Director of Education and the Ministry of Education.

- **Implement a large-scale reading program in schools.** The baseline study found poor performance across all EGRA subtasks in English and Kiswahili. The highest performance in oral reading fluency was observed under the coach/TAC Tutor intervention group. For this group, the average fluency scores were 15.6 wpm in English and 13 wpm in Kiswahili. The Kenyan benchmarks of 65 wpm and 45 wpm are almost three times higher. Our results showed that very small percentages of pupils were able to read and comprehend what they read in either Kiswahili or English. We therefore recommend the MOE design and implement a literacy program that allows children to increase their phonemic awareness, knowledge of alphabetic principle, fluency, vocabulary, and reading comprehension skills systematically.

- **Train education managers in supporting a reading program.** The baseline findings showed that pupils in schools where the head teacher had received special training in managing a reading program recorded a much higher fluency score. On the same note, we recommend that continuous in-service training be arranged for teachers on reading methodology.
- **Improve access to reading materials**. The Kisumu ICT baseline findings indicated that a majority of schools had not attained the desired MOE pupil-textbook ratio of 1:1. Previous EGRA studies have shown that access to reading materials improves reading outcomes. We therefore recommend a concerted effort to ensure that each pupil has access to reading textbooks and supplementary reading materials.
- **Strengthen school management committees' (SMCs') involvement in schools.** The baseline findings showed a strong correlation between SMCs' participation in school management activities and learning outcomes. We therefore recommend schools to be encouraged and supported to embrace participation of SMCs in school planning and management activities, especially those directly linked to teaching and learning.
- **Design interventions with awareness of the ICT infrastructure in schools.** The EGRA baseline showed that these primary schools did not have the ICT infrastructure necessary for teaching and learning in the 21st century. Functional computers were available in less than 15% of the schools. Most schools did not have a computer room. In order for schools like those in this study to realize the full impact of ICT, they will need special computer rooms, electricity or solar connections, computers, and related technology such as projectors. Schools also must gain the technical capacity to handle and maintain technological tools. Without training and support for integrating the ICT infrastructure with instructional activities, these activities will not be cost-effective.
- **Conduct research on ICT required in schools.** The Kisumu ICT baseline study analyzed various ways in which head teachers were using technological devices. It showed that a small percentage of such tools were being used in teaching and learning, and that the primary ICT tool used was mobile phones. Even so, further analysis revealed that overall, phones were rarely used in teaching and learning. We therefore recommend that the MOE first pilot-test the effect of various technologies on learning outcomes before scaling the ICT programs to the national level. As noted, currently PRIMR is implementing a pilot test on the efficacy of e-readers, teacher tablets, and TAC Tutor tablets for teaching reading. After a period of time with the ICT intervention, PRIMR will again collect reading data and then compare it to the baseline data to produce statistically reliable evidence on the most appropriate ICT interventions for primary schools. After this evidence is released, sustainable decisions on ICT investments can be made.

Introduction

In Kenya, the government commitment to the education sector is substantial, as almost one third of national gross domestic product is invested in education annually, or close to 126 billion shillings. A majority of these funds, almost 97%, is raised in Kenya, with the remaining 3% from the donor community.

In line with the Millennium Development Goals and Education for All, Kenya has made progress toward attaining international goals. More critically, developing children's capacities in literacy and numeracy through effective interventions can enable an entire generation to become economically independent and positive contributors to society. Investing in literacy and numeracy among young pupils is perhaps the single most promising action to end extreme poverty in Kenya in line with the goals of Vision 2030.

Free primary education, which began in 2003 in Kenya, has been responsible for many of the gains recorded in the education sector. As compared to results from 2002, this sector has witnessed significant increments in enrollment in learning institutions, specifically early childhood development centers (nurseries or preschools), primary schools, secondary schools, Technical/Industrial and Vocational Education and Training Institutes (TIVETs), and colleges and universities.

Major strides have been made toward access to education in both primary and preschool, with some counties recording gross enrollment rates of more than 100%. Gender parity in education has also improved. With these gains, however, there has been immense pressure on the existing school infrastructure, instructional materials, and the number of deployed qualified teachers. This is reflected in high pupil-class ratios (surpassing 40 pupils per class, which is the standard recommended by the Ministry of Education [MOE]) and high pupil-textbook ratios of more than three pupils per book against the desired ratio of 1:1. This strain has therefore called for concerted efforts from both government and private sectors to improve education quality. Public and private participation has been enabled through the prevailing framework environment implemented by the Ministry of Education under the Kenya Education Sector Support Program (KESSP) of 2005–2010.

The United States Agency for International Development (USAID) has supported the Kenyan MOE's goals of improving education within KESSP and the forthcoming National Education Sector Support Programme (NESSP). This is reflected in its support for and involvement in a number of initiatives aimed at assessing learning outcomes in lower primary using tools and materials that have been successfully applied elsewhere in sub-Saharan Africa. In June 2007, the Early Grade Reading Assessment (EGRA) was piloted (see East African Development Consultants & RTI International, 2008) and followed up with an intervention in Malindi with the objective of improving reading outcomes in lower primary (see Piper, Korda, & Mumo, 2009). In June 2009, USAID funded the piloting of the Early Grade Mathematics Assessment (EGMA), while in 2009 and 2010, the William and Flora Hewlett Foundation funded an assessment of learning outcomes using EGRA in four languages (Gikuyu, Dholuo, Kiswahili, and English), with particular emphasis on the language of instruction (LOI) used in classrooms (Piper, 2010).

These data showed that pupils in lower classes had low levels of reading and numeracy skills. In the study conducted in Malindi in 2007, Class 2 pupils were able to identify an average of only 4.7 and 22.7 letters per minute in Kiswahili and English respectively. When asked to read a short story, the pupils could read only 10.2 words per minute (wpm) in Kiswahili and 11.4 in English. In a study conducted in 2009 in four languages in Central Kenya and Luo Nyanza, the average oral reading fluency was 30.4 wpm in English, 21.2 wpm in Kiswahili, 20.0 wpm in Gikuyu, and 19.6 wpm in Dholuo. Numeracy levels were similarly low. In Malindi in 2009, Class 1 children could identify only 27.5% of the numbers they were shown and could fill in the missing number only 5.3% of the time. Fifty percent of the children in Classes 1–3 answered less than 50% of the word problems correctly, with Class 1 pupils answering only 25.8% of the word problems correctly.

Lessons learned from the implementation of reading and mathematics instructional improvements in Malindi, Nakuru, Kiambu, and Nairobi have indicated that pupils' reading outcomes can be improved with the right mix of interventions, including the development of lesson plans, teacher training, the use of carefully designed reading and instructional materials, and targeted supervision and monitoring of the teaching and learning process.

Purpose and Objectives of the Primary Math and Reading (PRIMR) Initiative

The ability to read and understand simple text is the most basic skill that children need in the early grades. Low literacy levels among primary school children affect their performance in other subjects, including mathematics, science, and social studies. Children who cannot read are more likely to drop out of school before they complete primary school, especially because of frustration, discouragement, and stigmatization by their peers and teachers. Similarly, children need a firm foundation in basic mathematical skills in order to function in an increasingly competitive and technologically based world. In particular, Kenyan children need numeracy skills to access a basic economic understanding that is applicable to their day-to-day life situations.

Borne out of the concern to improve the quality of reading and numeracy in early grades in Kenya, Kenya's Ministry of Education and USAID decided to design the Primary Mathematics and Reading Initiative, implemented by RTI International. PRIMR is being implemented in three phases (see ***Figure 4***). During the first year of the project (2012), a total of 66 government schools and 60 nonformal (NF) schools became the first active cohort to participate in PRIMR activities. The design had two strands of nonformal schools; 30 of the nonformal schools were allocated two instructional coaches each (15:1 ratio) and another 30 schools, three instructional coaches (10:1 ratio). This was in order to help PRIMR determine the impact of coach-teacher ratio on outcomes and cost.

Figure 4: PRIMR Initiative research design

School Type	Experimental Group	Cohort	No. of Schools	2011	2012			2013			2014
				Term 3	Term 1	Term 2	Term 3	Term 1	Term 2	Term 3	Term 1
Government	Treatment	1	73								
		2	65								
	Control	3	51								
ICT	PRIMR + Coach	2	20								
	PRIMR + Teacher	2	20								
	PRIMR + e-reader	2	20								
	Control	3	20								
Nonformal (NF)	NF 10:1*	1	30								
	NF 10:1*	2	60								
	NF 15:1*	1	30								
	NF 15:1*	2	60								
	Control*	3	60								

Key

	Continuous assessments for PRIMR schools
	Intervention under way in PRIMR school
	Sample-based Early Grade Reading Assessment
*	Ratio of schools to coaches

In January of the second year of PRIMR (2013), an additional 65 government schools and 120 nonformal schools began their participation in project activities, bringing the total number of government and nonformal schools to 218 and 180 respectively. Half of the nonformal schools that joined the initiative in 2013 (60 schools) have a school-coach ratio of 10:1 and the other 60 schools have a school-coach ratio of 15:1.

The third PRIMR component in the experimental design is an ICT-based intervention which began in January 2013. The intervention comprises 80 government schools and it is being implemented in Kisumu County. The ICT-based intervention consists of three subgroups of 20 schools, each carrying out different activities, as follows: (1) The first subgroup is using electronic tablets to bolster the Teachers' Advisory Centre (TAC) Tutor instructional support system in 20 schools, 10 each in Bolo and Ragumo zones. (2) In the second subgroup, teachers are using enhanced teachers' guides on tablets, specially fitted with PRIMR instructional materials, as well as specially designed classroom pedagogical supports, including virtual flashcards, additional reading materials, and the RTI-developed continuous-assessment software called Tangerine:Class™. This treatment is being implemented in 20 schools—10 each in Barkorwa and Nyabondo zones. (3) The third subgroup of schools is using e-readers to help pupils practice their reading skills. Again this is being implemented in 20 schools—10 each in Kodingo and Bolo zones. Finally, 20 schools (10 in Ahero zone and 10 in Chulaimbo zone) are serving as the control schools in 2013, but will have intervention support in 2014. The control group will be provided the treatment that is proven to be most effective.

The PRIMR design includes a longitudinal study that will follow a selected group of children over a period of three years. A longitudinal design is appropriate for various reasons, but perhaps the key point is that reading growth is not linear. Development of foundational skills in early grades is best assessed with a series of interrelated measures of foundational skills that document the development of these skills and predict the acquisition of later skills. Once foundational skills are established, oral reading fluency and comprehension measures can then be used to assess improved reading. A longitudinal study that follows and monitors students' reading development is therefore the best way of establishing reading trajectories for groups of children. This longitudinal study will allow the MOE to understand how children transfer reading skills across languages, as well as provide the MOE with benchmarking information, since the levels of successful Class 3 readers at final assessment can be compared with where they started in Classes 1 and 2.

As noted, the PRIMR Initiative also incorporates control groups at each level of treatment. A control group of 51 government schools was selected and another control group of 60 nonformal schools were selected. The third treatment component—the ICT-based intervention for which this baseline study was carried out—has a control group of 20. To meet established research ethical standards, all schools selected for the control groups at each intervention level will receive the appropriate PRIMR activities in 2014 after endline data are collected at the end of 2013.

Early Grade Reading Assessment

EGRA was first trialed in Malindi in 2007–2008 as a tool to evaluate a literacy intervention; followed up with a complex analysis of reading outcomes investigating the impact of language of instruction in 2009–2010; and then, most recently, used to assess student outcomes in nonformal schools in 2011. EGRA assesses a set of skills critical to early reading acquisition. The tailored version of the tool used for the ICT baseline study in Kisumu built upon the versions used earlier in Kenya. The subtasks included the following:

- Letter-sound fluency: ability to identify the sounds of the letters fluently.
- Nonword fluency: ability to decode new or unfamiliar words fluently. The subtask consists of made-up words that follow the linguistic rules but do not actually exist in either English or Kiswahili. Sometimes these are referred to as nonsense words. Fluency is measured by words read correctly per minute.
- Oral reading (connected text) fluency: ability to read a story, approximately 60 words long—with fluency again measured by words read correctly per minute.
- Reading comprehension: ability to answer comprehension questions based on the passage read – measured by percent correct out of the five comprehension questions.
- Listening comprehension: ability to understand a simple story read aloud by the assessor.
- Maze stories: ability to read and comprehend a short story requiring that pupils supply several missing words (structured as multiple choice).

Apart from the EGRA listening comprehension subtask, which was administered only for Kiswahili, all of the subtasks were assessed in both English and Kiswahili. In addition, the EGRA English tool contained a section (pupil context interview) measuring a variety of learner background variables that were aimed at identifying factors consistently correlated with performance.

Snapshot of School Management Effectiveness (SSME)

Instructional leadership and pedagogical quality were assessed using a tailored version of the SSME tool. The SSME contains a classroom observation checklist for collecting information such as the languages used by the teacher during instruction (Kiswahili, English or local language) and the teacher's interaction with students (e.g., is the teacher speaking to the entire class, a group, or a single student? Are students left to work on their own or in groups?). These data were supplemented with information collected through interviews with head teachers, teachers, and pupils.

The head teacher questionnaire contained questions on the following:

- Staffing levels in the school; teachers' their training level, including whether they had received special training in implementing a reading program.
- Teacher attendance and supervision.

- Instructional materials in schools—textbooks for English and Kiswahili as well as other reading materials.
- Parental involvement in school management and accountability.
- School infrastructure such as availability of electricity, clean and safe drinking water, sanitation facilities in the school, library, and computer rooms, among other facilities.
- ICT facilities and equipment in the school and their use in teaching and learning.

The teacher questionnaire contained questions on the following:

- Pupil attendance.
- Teacher training, with a focus on English and Kiswahili.
- Methods used in pupil assessments, and frequency of assessments.
- Use of assessment results.
- Instruction materials in schools—schemes of work, lesson plans, English and Kiswahili textbooks and other reading materials.
- Activities that are frequently used in teaching.
- Opinion on the class level by which pupils should demonstrate various learning outcomes.
- ICT facilities and equipment used in teaching and learning at the classroom level.

Kisumu County ICT Research Design

Pupils reading using e-readers in Kisumu county.

The fundamental question that the Kisumu County ICT intervention study will answer is how and whether a set of ICT interventions in Kenya makes a difference for pupil achievement in Class 2. The use of ICT is intended not to introduce teachers and pupils to flashy machines, but to see whether and how ICT can improve and simplify teaching and learning. What we care about is learning, and learning only. Each ICT intervention is being compared against each other and the control group to measure effectiveness and cost-effectiveness. As noted, the ICT trial is being implemented and managed by the PRIMR Initiative in Kisumu County.

Urban and rural zones were randomly assigned to four treatment groups, to compare how the interventions work in both settings. Eight zones total were selected for this program, as explained in ***Table 1.***

Table 1: Treatment groups for ICT interventions

Treatment Group	ICT Intervention	Schools	Pupils	Zones
PRIMR + tutor tablet	TAC Tutors with tablets for supervision and assessment	20	701 339	Ragumo (urban) Bolo (rural)
PRIMR + teacher tablet	Teachers with tablet with multimedia lesson plans, virtual flashcards, and continuous-assessment tools	20	432 452	Nyabondo (rural) Barkorwa (urban)
PRIMR + pupil e-reader	Pupils with e-readers, loaded with PRIMR content, Kenyan textbooks, and supplementary reading materials	20	603 328	Otonglo (urban) Kodingo (rural)
Control	None	20	1000	Ahero (urban) Chulaimbo (rural)

All four groups will be subjected to a rigorous set of baseline (January 2013) and final (October 2013) assessments to determine what causal effect each ICT intervention has on student achievement. This design, mixed with the randomized assignment of schools to the interventions, will allow RTI to estimate what impact each ICT intervention has on student achievement. The design will also allow for estimation of whether and how the ICT interventions affected student outcomes over and above the standard PRIMR package of interventions. In summary, PRIMR will assess the following interventions against a group of control schools:

- **PRIMR + TAC tutor tablet:** This intervention provides TAC Tutors with a tablet with technology to support their visits to schools.
- **PRIMR + teacher tablet pack:** This intervention provides teachers with a tablet to supplement their PRIMR instruction. The tablet has multimedia lesson plans; supplementary pedagogical aids, including letter flashcards and audio capabilities to practice letter sounds; and continuous-assessment programs.

A teacher using a tablet for Kiswahili instruction.

- **PRIMR + pupil e-readers:** This treatment provides e-readers to pupils and teachers. They contain the PRIMR reading textbooks in English and Kiswahili, relevant textbooks from Kenyan publishers, and hundreds of age-appropriate stories related to the Kenyan curriculum.

Given Kenya's interest in scaling up ICT interventions, this experimental study will focus on understanding the mechanisms by which the various interventions work. We are interested in three questions: First, does the technology improve achievement? Second, how cost effective are the interventions? And third, *how* do the interventions change learning to improve achievement?

Cost is an important issue, and all decisions on which materials are preferred should be considered with cost in mind. Our calculations suggest that a program using a laptop would have to be 22 times more effective than the basic PRIMR program to be cost-effective. Similarly, the e-reader program would have to be 10 times more effective to make it cost-effective. This means that both the e-reader and tablet programs are likely going to be much more cost-effective than options using a laptop. This study will provide Kenya with a tremendous amount of information relevant for decision making regarding which ICT interventions are the best investment in terms of student outcomes and whether ICT interventions are worth the cost, given scarce resources available at scale-up.

The goal of this ICT intervention is to provide the MOE with information as to how to maximize ICT for cost-effectively improving learning in Kenya.

Objectives of the Kisumu ICT Baseline Study

As indicated, schools implementing the ICT component of the PRIMR initiative joined the intervention in January 2013. Before the intervention, it was imperative to establish the status of early grade reading in Kisumu County. The results of the baseline study will serve as a benchmark on Class 2 reading abilities, pupils' degree of mastery of specific component skills of reading, and the relationship of these skills to selected factors in the school and home environment.

Key objectives of the baseline were to:

1. Establish the baseline reading fluency in English and Kiswahili of pupils in Class 2 in both the intervention and control schools.
2. Establish the reading comprehension levels in English and Kiswahili of pupils in Class 2 in intervention and control schools.
3. Establish the existing pedagogical methods, including language-of-instruction usage in reading in Class 2, in intervention and control schools.
4. Assess the availability of teaching and learning materials in reading in both intervention and control schools.
5. Assess the availability and usage of ICT tools in teaching and learning in both intervention and control schools.
6. Assess pupil background factors and their effects on reading in both intervention and control schools.
7. Determine whether, prior to the PRIMR ICT pilot interventions, there were statistically significant differences between treatment groups that would require further statistical accounting to ensure a fair comparison.

At the end of the intervention, this evidence will be used in Kisumu and by the MOE to determine the treatment given to the control schools, discuss education quality at the lower levels, as well as to help the MOE decide whether there are cost-effective methods of using ICT in Kenya.

Research Design and Methodology

This section provides details of the design and implementation of the Kisumu County ICT program, including the baseline study.

Research Design and Sampling

Sampling for the Kisumu ICT baseline study was undertaken in three steps. It first involved the selection of zones for participation in PRIMR and assignment to treatment groups. At the time sampling was conducted, there were six education districts within Kisumu County, namely Nyakach, Nyando, Kisumu Municipality, Kisumu West, Kisumu East, and Muhoroni. Zones from these districts were classified as either rural or peri-urban. Four zones were then selected from rural (Barkorwa, Kodingo, Bolo, and Chulaimbo) and peri-urban Kisumu (Ahero, Ragumo, Otonglo, Nyabondo). After selection to the PRIMR Initiative, these zones were randomly assigned to treatment conditions, stratified by urbanicity. The second stage of sampling to the baseline study involved random selection of 10 schools from each of the eight zones. In total, therefore, the baseline survey was undertaken in a total of 80 schools in Kisumu County.

Treatment Groups

The treatment groups were assigned by zones. Each of the selected eight zones contributed 10 schools for the ICT pilot. Barkorwa and Nyabondo zone were assigned to the teacher tablet treatment group. Ragumo and Bolo provided tablets for each TAC Tutor; Kodingo and Otonglo provided e-readers for pupils. Chulaimbo and Ahero are serving as control schools for the year 2013 but will receive an intervention in the year 2014. ***Table 2*** shows the zones and treatment groups.

Table 2: Type of ICT treatment, by zone

Treatment	Type of zone	
	Peri-urban	Rural
Tablets for TAC Tutors	Ragumo	Bolo
Tablets for teachers	Barkorwa	Nyabondo
E-readers	Otonglo	Kodingo
Control	Ahero	Chulaimbo

Sample Sizes

The Kisumu ICT baseline study targeted 20 Class 2 pupils per school, a head teacher, and at least one teacher from each of the sampled 80 schools. We utilized simple random sampling at the Class 2 level to obtain a sample of 20 pupils by school. ***Table 3*** shows the achieved sample, by treatment type.

Table 3: Achieved sample for baseline assessment, by treatment group and number of pupils

Zones	Treatment					Number of schools
	Control	TAC Tutor tablet	Teacher tablets	E-readers	Total	
Ahero	199	—	—	—	199	10
Barkorwa	—	—	200	—	200	10
Bolo	—	197	—	—	197	10
Chulaimbo	197	—	—	—	197	10
Kodingo	—	—	—	190	190	10
Nyabondo	—	—	199	—	199	10
Otonglo	—	—	—	200	200	10
Ragumo	—	198	—	—	198	10
Total	**396**	**395**	**399**	**390**	**1,580**	**80**

Our achieved sample was quite close to our planned sample, particularly in Barkorwa and Otonglo, which reached 100% of target pupils. The lowest rate was in Kodingo, which was 95% of the target group. This was the result of low enrollments in two of the sampled schools in the zone. The achieved sample had sufficient power to detect statistical differences by performance across the three treatment groups as compared to the control group.

Reliability Analyses

In order to examine whether and how subtasks in EGRA were reliable and whether they were appropriate in assessing Class 2 pupils in Kisumu, a reliability analysis was undertaken. This was achieved by first examining Pearson's bivariate correlations and then generating the Cronbach's alpha reliability test. The latter was used to determine the internal consistency of the EGRA instruments used during the baseline. These measures were applied to the EGRA in both English and Kiswahili. Results are as shown below.

English Tool Analysis

Table 4 presents bivariate correlations for subtasks in the English tool. There were statistically significant positive correlations among letter-sound fluency, nonword fluency, and reading

comprehension. The highest correlation was between oral reading fluency and nonword fluency. This suggests that in English in Kisumu, knowing how to decode words is critical for reading fluently.

We found statistically significant negative correlations (although modest in magnitude) between the Maze subtask and the other four subtasks. We had difficulty interpreting this finding, but did recognize that the value of the Maze subtask in English might be limited by the lack of vocabulary and comprehension skills that most pupils exhibited in the PRIMR midterm assessment in October 2012.

Table 4: Pearson's correlations for EGRA English subtasks

	Letter-sound fluency	Nonword fluency	Oral reading fluency	Reading compre-hension	Maze compre-hension
Letter-sound fluency	1.00				
Nonword fluency	0.67***	1.00			
Oral reading fluency	0.57***	0.86***	1.00		
Reading comprehension	0.32***	0.48***	0.60***	1.00	
Maze comprehension	-0.10***	-0.09***	-0.05	-0.02	1.00

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

As stated above, we also undertook a Cronbach's alpha reliability test to determine the reliability of the EGRA English tool. As shown in ***Table 5,*** results for EGRA English, all subtasks except nonwords and oral reading fluency had alpha coefficients above 0.7. The overall alpha for EGRA English was 0.75. These Cronbach's alpha levels imply that the internal consistency of the Kisumu EGRA was acceptable, and similar to Cronbach's alpha results from other EGRA studies in Kenya.

Table 5: Cronbach's alpha for the English subtasks, Maze included

Subtask	Item-test correlation	Item-rest correlation	Alpha
Letter-sound fluency	0.75	0.58	0.77
Nonword fluency	0.88	0.78	0.61
Oral reading fluency	0.87	0.77	0.61
Reading comprehension	0.68	0.48	0.72
Maze comprehension	0.35	0.08	0.85
Total			**0.75**

Given the unexpected negative correlations between Maze comprehension and the rest of the EGRA subtasks in this Kisumu baseline, a Cronbach's alpha for the English instrument also was generated *excluding* this subtask. Results are displayed in ***Table 6.***

Table 6: Cronbach's alpha for the English subtasks, Maze excluded

Subtask	Item-test correlation	Item-rest correlation	Alpha
Letter-sound fluency	0.77	0.60	0.84
Nonword fluency	0.91	0.82	0.75
Oral reading fluency	0.91	0.83	0.74
Reading comprehension	0.72	0.52	0.86
Total			**0.85**

Comparing Tables 5 and 6, it can be deduced that excluding the English Maze subtasks resulted in even higher results for internal consistency within the EGRA English tool, with an alpha of 0.85.

EGRA Kiswahili Tool Analysis

A reliability analysis was also conducted for the Kiswahili EGRA tool that was used during the baseline study. ***Table 7*** shows bivariate correlations for the subtasks in this tool. Four EGRA Kiswahili subtasks—letter-sound fluency, nonword fluency, oral reading fluency, and reading comprehension—were found to have statistically significant positive correlations with each other. Similar to the English EGRA tool, nonword fluency and oral reading fluency had the highest correlations—nearly 0.9—which implies that the more a child can correctly decode nonwords, the more likely the child can read a passage fluently.

The Maze subtask, however, was not correlated with oral reading fluency, reading comprehension, or listening comprehension, and was negatively correlated with letter-sound fluency and nonword fluency. Again, recall that the Maze subtask was not measuring the same constructs as the other subtasks.

Table 7: Pearson's correlations for EGRA Kiswahili subtasks

	Letter-sound fluency	Nonword fluency	Oral reading fluency	Reading compre-hension	Listening compre-hension	Maze compre-hension
Letter-sound fluency	1.00					
Nonword fluency	0.61***	1.00				
Oral reading fluency	0.62***	0.88***	1.00			
Reading comprehension	0.46***	0.63***	0.69***	1.00		
Listening comprehension	0.26***	0.27***	0.31***	0.42***	1.00	
Maze comprehension	-0.10***	-0.02***	-0.05	-0.03	-0.04	1.00

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

As with the English instrument, the Cronbach's alpha reliability test on EGRA Kiswahili subtasks was generated twice, including and excluding the Maze subtask. Results for these two measures of internal reliability are indicated in ***Tables 8 and 9.***

As shown in Table 8, letter-sound fluency, listening, reading comprehension, and Maze comprehension all reported acceptable alpha scores of more than 0.7.

Table 8: Cronbach's alpha for the Kiswahili subtasks, Maze included

Subtask	Item-test correlation	Item-rest correlation	Alpha
Letter-sound fluency	0.75	0.60	0.72
Nonword fluency	0.83	0.73	0.69
Oral reading fluency	0.87	0.78	0.67
Reading comprehension	0.79	0.67	0.70
Listening comprehension	0.56	0.36	0.78
Maze comprehension	-0.33	0.06	0.84
Total			**0.78**

Some of the lower alpha correlations can be attributed to the behavior of the Maze subtask. When Maze was excluded from the subtasks used to compute the alpha score, subsequent alpha levels for all the remaining subtasks rose, as shown in Table 9, from a minimum of 0.72 (letter sound fluency) to a maximum of 0.88 (listening comprehension).

Table 9: Cronbach's alpha for the Kiswahili EGRA subtasks, Maze excluded

Subtask	Item-test correlation	Item-rest correlation	Alpha
Letter-sound fluency	0.75	0.60	0.72
Nonword fluency	0.87	0.77	0.77
Oral reading fluency	0.90	0.82	0.76
Reading comprehension	0.82	0.70	0.79
Listening comprehension	0.58	0.37	0.88
Total			**0.84**

EGRA Findings

The Kisumu ICT baseline data were analyzed to examine the performance of pupils in Kisumu County. Performance on these subtasks then was compared against a variety of factors that could have affected reading in Class 2. ***Tables 10 and 11*** present summary statistics on the key performance measures.

Table 10 presents the findings on reading in English, and shows that fluency in letter sounds was higher than in other subtasks, with pupils being able to correctly sound an average of 13.4 letters

per minute. Nonword fluency was 8.5 words per minute. It is logical that nonword fluency would be lower than letter-sound fluency, as pupils must employ their knowledge of letter sounds to decode words. Nonword decoding in English was difficult for pupils in Class 2 in Kisumu, as the maximum rate was only 49 words per minute. Oral reading fluency (reading a connected text story) had slightly higher rates, with fluency rates of 9.3 words per minute. We expected a slightly higher outcome for oral reading fluency as compared to nonword fluency, as the oral connected-text passage included many familiar words which could be identified very quickly. After the pupils had read the oral passage, they were asked five comprehension questions of various types to assess their level of reading comprehension. The average performance in reading comprehension was 5.0%. Notably, more than 83% of all pupils in the survey answered 0% of the comprehension questions correctly.

Table 10: English subtasks results for all pupils

Subtask	Mean	Std. dev.	Std. error	Min.	10th percen-tile	50th percen-tile	90th percen-tile	Max.
Letter sounds (per minute)	13.43	15.07	0.38	0	0	8	35	89
Nonwords (per minute)	8.48	10.96	0.28	0	0	2	25	49
Oral reading fluency (per minute)	9.32	13.66	0.34	0	0	3	29	87
Reading comprehension (%)	5.00	0.12	0.003	0	0	0	20	100

Table 11 presents findings for Kiswahili reading in Kisumu County. Average performance was disappointingly low, much like English. Letter sound fluency was about 17 letters per minute, which was slightly higher than in English. Nonword fluency was lower in Kiswahili than in English, at 5.9 wpm, while oral reading fluency was only 8.9 words per minute. Reading comprehension average performance was 6.6%, which was slightly higher than in English, but still very low.

Table 11: Kiswahili subtask results for all pupils

Subtask	Mean	Std Dev.	Std. Error	Min.	10th percen-tile	50th percen-tile	90th percen-tile	Max.
Letter sounds (per minute)	16.95	15.57	0.39	0	0	13	40	99
Nonwords (per minute)	5.88	9.06	0.23	0	0	0	21	51
Oral reading fluency (per minute)	8.94	11.47	0.29	0	0	3	26.5	60
Reading comprehension (%)	6.60	0.14	0.004	0	0	0	20	100

We are interested in understanding the performance of reading across languages in Kisumu County. As indicated in ***Figure 5,*** pupils were slightly more fluent in Kiswahili sounds than in English (17.0 vs. 13.4 letters per minute). This is logical given that the Kiswahili sounds seem

more consistent than the English sounds for many Kenyan pupils. However, English performance on nonword and oral reading fluency was slightly lower than in Kiswahili. This was somewhat surprising, given that in general, English words are much shorter than Kiswahili ones. Ideally, it would be expected that pupils would do better on Kiswahili than English, since Kiswahili is ostensibly the second language of most pupils in Kenya. However, the Kisumu County population has a different relationship with English and Kiswahili than many other parts of Kenya.

Figure 5: Comparison between performance in English and Kiswahili

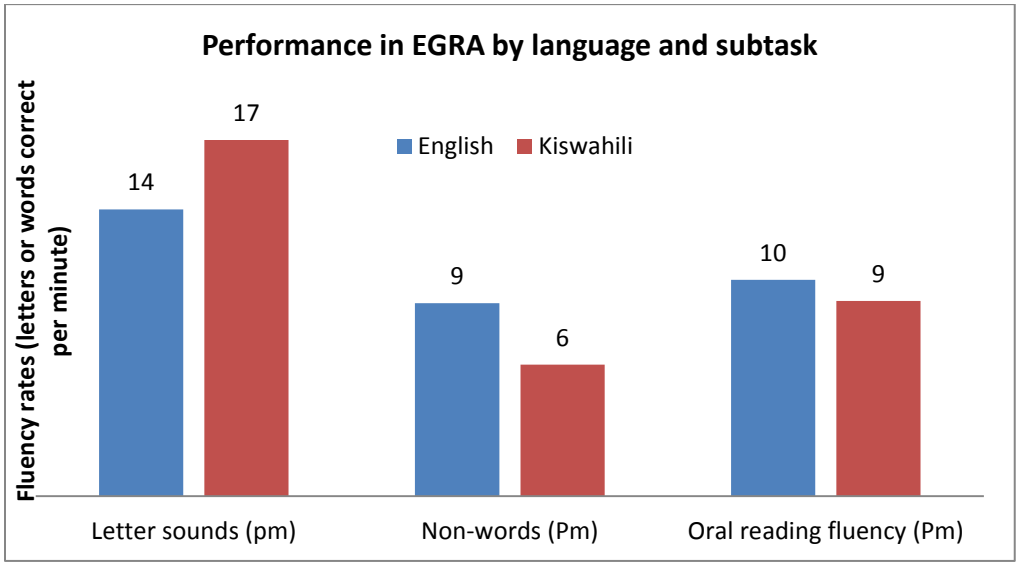
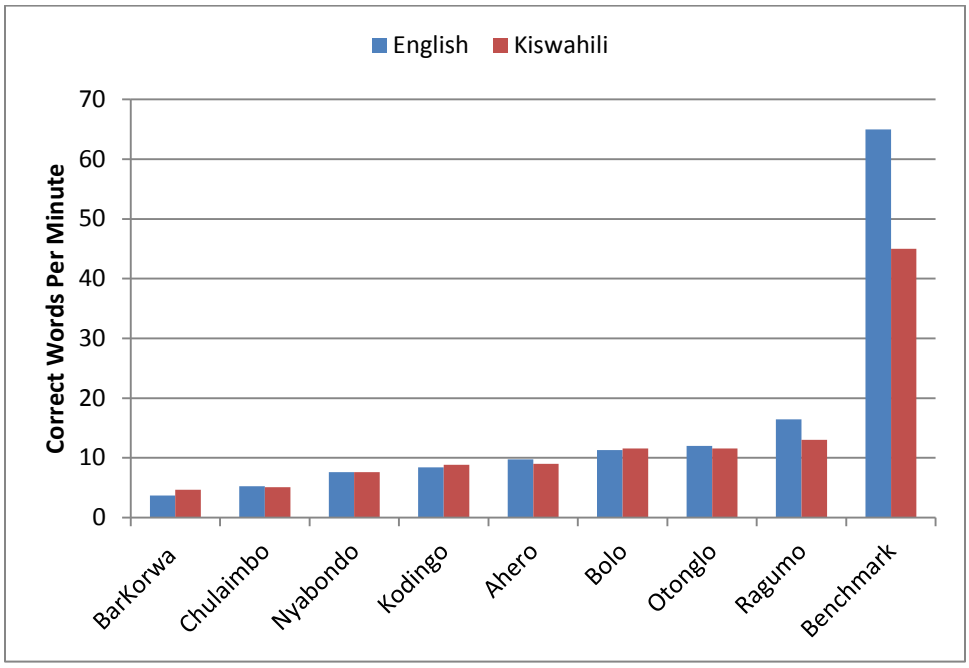


Figure 6 below shows that the outcomes for each of the eight zones assessed in January 2013 were relatively similar. The outcomes for all zones, on oral reading fluency on connected text, remained very far from the benchmarks set by the MOE.

Figure 6: Kisumu County Class 2 oral reading fluency rates in English and Kiswahili disaggregated by zone and compared to benchmark rates



This initial analysis of summary statistics shows that these pupils in Class 2 in Kisumu County were struggling to read in both Kiswahili and English. This difficulty occurred in all the foundational areas measured by the EGRA tool. The extent of the difficulty was somewhat surprising due to the reputation that Kisumu County has as strong center for education in Kenya.

Comparison of Treatment Groups by EGRA Subtask

Recall that each of the PRIMR ICT interventions (tablets for TAC Tutors, tablets for teachers, e-readers for pupils) was randomly assigned to randomly selected zones (stratified by urban and rural status) to determine the effectiveness and cost-effectiveness of each option. Although PRIMR's zones were randomly assigned, and although that randomization should have accounted for any differences in baseline performance across treatment groups, we were interested in understanding whether and how outcomes may have differed across the treatment groups prior to the intervention. If so, we would have to employ additional identification strategies in order to ensure that our analysis could attribute causality to the changed performance that we are hypothesizing will be seen in schools.

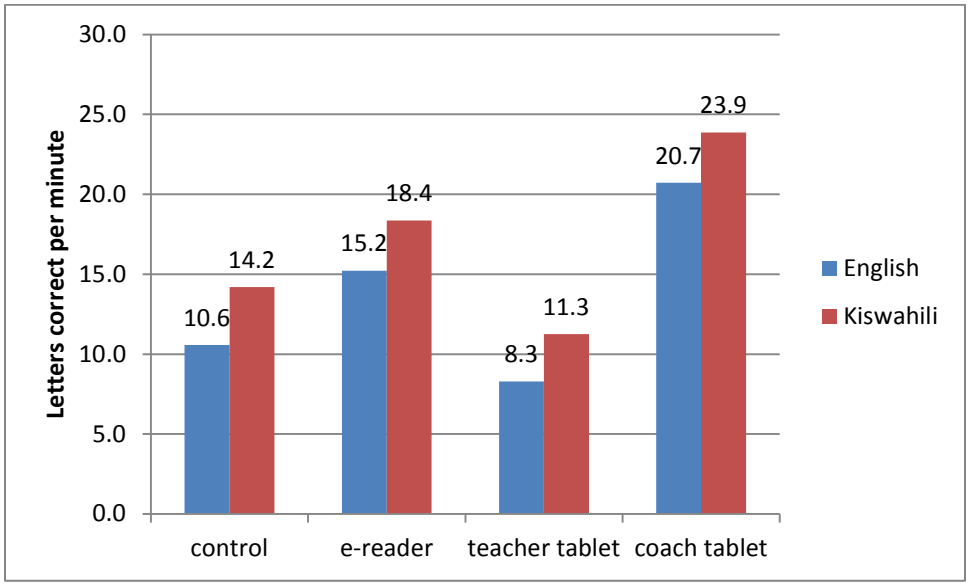
In order to successfully measure the gains attributed to the three treatment groups, we assigned schools to the control group, which is not receiving any treatment in the current year. It was important to ensure that all the groups started at the same baseline and then use statistical methods to account for any differences. This section compares the EGRA baseline findings for subtasks by treatment group. In all comparisons shown below, the three treatments are compared to the control, which serves as the reference group.

Letter sounds

Figure 7 compares letter-sound fluency by treatment group for both English and Kiswahili. We used *T*-tests to determine whether the differences were statistically significant. In English, performance in letter-sound fluency in the e-reader group was 15.2 letters per minute, as compared to the control group, which was 10.6 letters per minute; this was a statistically significant difference ($p < 0.05$). The 20.7-letter-per-minute outcome for the TAC Tutor tablet group also was higher than for the control group ($p < 0.01$). The difference in letter-sound fluency between the control group and the teacher tablet group (8.3 letters per minute against 10.6 letters per minute) was not statistically significant ($p = 0.10$).

For Kiswahili, the TAC Tutor tablet pupils (23.9 letters per minute) outperformed their control counterparts (18.4 letters per minute; $p < 0.01$). Comparisons between control and e-reader ($p = 0.06$) and control and teacher tablet ($p = 0.21$) were not significant.

Figure 7: Letter-sound fluency, by language and treatment



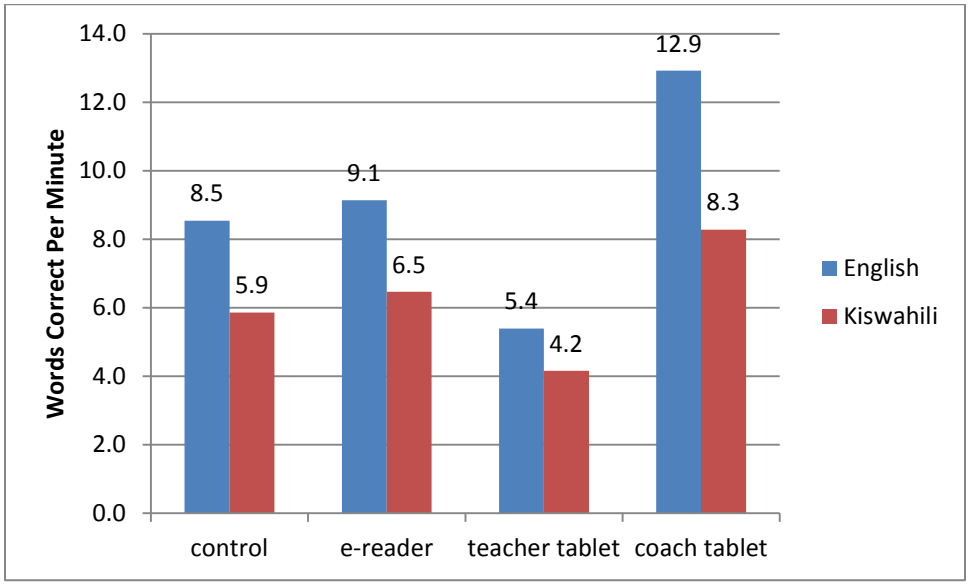
Nonwords

Fluency in nonwords was measured by calculating the number of nonwords decoded correctly per minute. ***Figure 8*** shows the distribution of scores by language. None of the differences was statistically significant for either English or Kiswahili. For English, there were no differences between the e-reader and control groups ($p = 0.79$), nor the teacher tablet and control groups ($p = 0.25$), nor the TAC Tutor tablet and control groups ($p = 0.12$).

Similarly, there was only one significant statistical difference between nonword fluency scores in Kiswahili. There were no differences between the control group and the e-reader group ($p = 0.058$), or the control group and the teacher tablet group ($p = 0.209$). There was, however, a significant statistical difference in the nonword fluency score between control schools and the TAC Tutor tablet group ($p < 0.05$).

Substantively, Figure 6 suggests slightly higher performance in nonword fluency in English than in Kiswahili, which is somewhat surprising given the deep orthography of English as compared to Kiswahili.

Figure 8: Nonword fluency, by language and treatment



Oral reading fluency

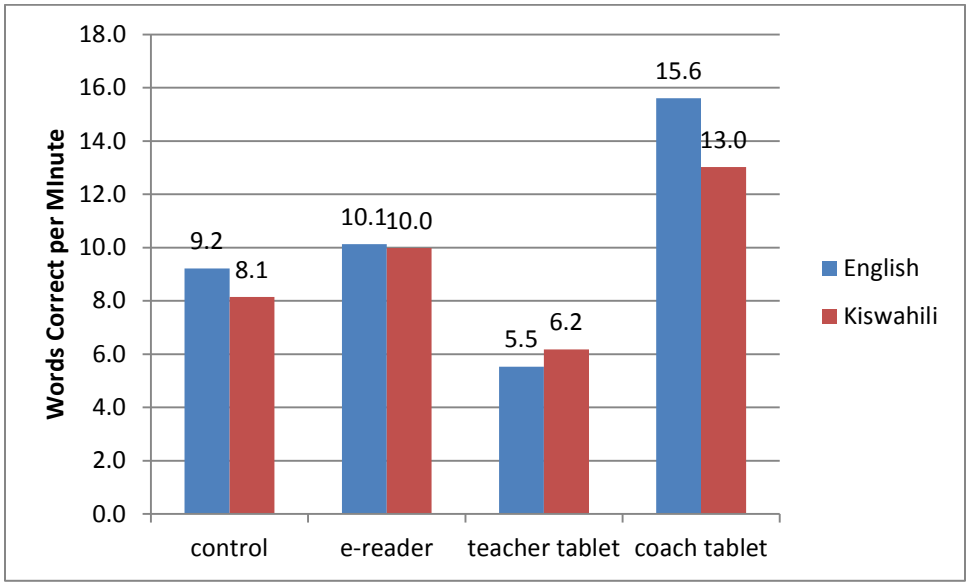
For both English and Kiswahili, pupils were given a story to read. This story was timed at 60 seconds. Oral reading fluency rates were calculated by measuring the correct words read in the passage in one minute. ***Figure 9*** shows this performance disaggregated by language and the four treatment groups.

There were no statistically significant differences between the control group and the other three groups. The difference between control group and e-reader was insignificant ($p = 0.73$), as was the difference between the control and teacher tablet group ($p = 0.30$) and between the control and TAC Tutor group ($p = 0.08$).

Similar findings emerged when oral reading fluency scores for Kiswahili were compared across the four groups. None of the differences was significant, with no difference between the control group and the e-reader group ($p = 0.36$); the control group and teacher tablet group ($p = 0.45$); and the control group and TAC Tutor tablet group ($p = 0.054$).

For this key subtask, then, any small differences exhibited in Figure 7 were statistically insignificant. There might be substantive gaps between the e-reader and TAC tutor tablet groups, though, as they showed the largest differences.

Figure 9: Oral reading fluency, by language and treatment



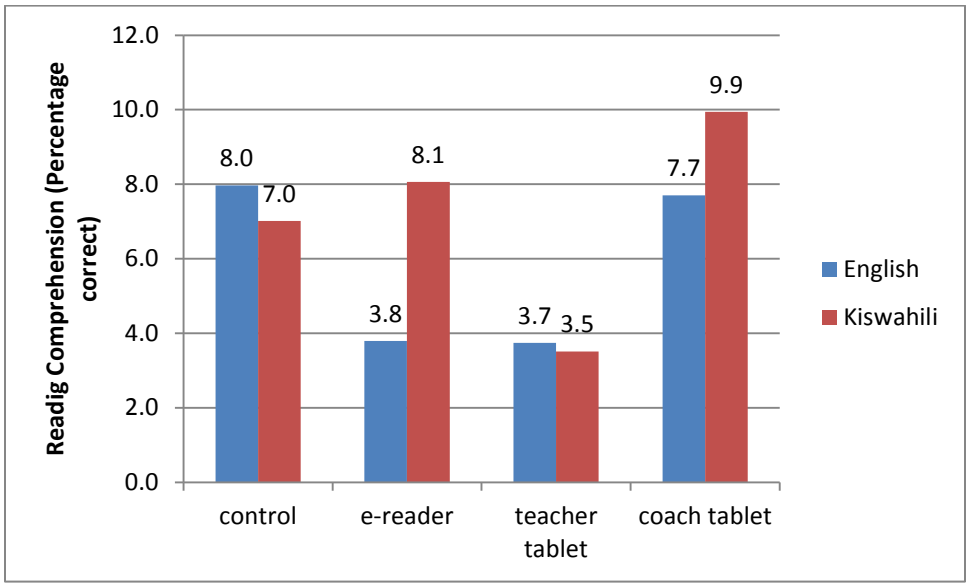
Reading comprehension

Pupil reading comprehension was assessed by asking pupils five questions based on the story they had read aloud. ***Figure 10*** shows the average percentage comprehension scores.

For English reading, all four groups averaged scores of less than 10%, which translates to less than half of the five questions answered correctly. The difference in performance across the four groups was not statistically different. There were no differences between the control and e-reader groups ($p = 0.20$); control and teacher tablet groups ($p = 0.28$); and control and TAC Tutor tablet groups ($p = 0.93$).

In Kiswahili, the average percentage comprehension scores ranged from 3.5% (teacher tablet group) to 9.9% (TAC Tutor group). The subtle differences in performance across the four groups were not statistically significant. This is evident by the slight differences between the control group and the e-reader group ($p = 0.58$); the control group and the teacher tablet group ($p = 0.15$); and the control group and the TAC Tutor group ($p = 0.15$).

Figure 10: Percentage reading comprehension scores, by language and treatment



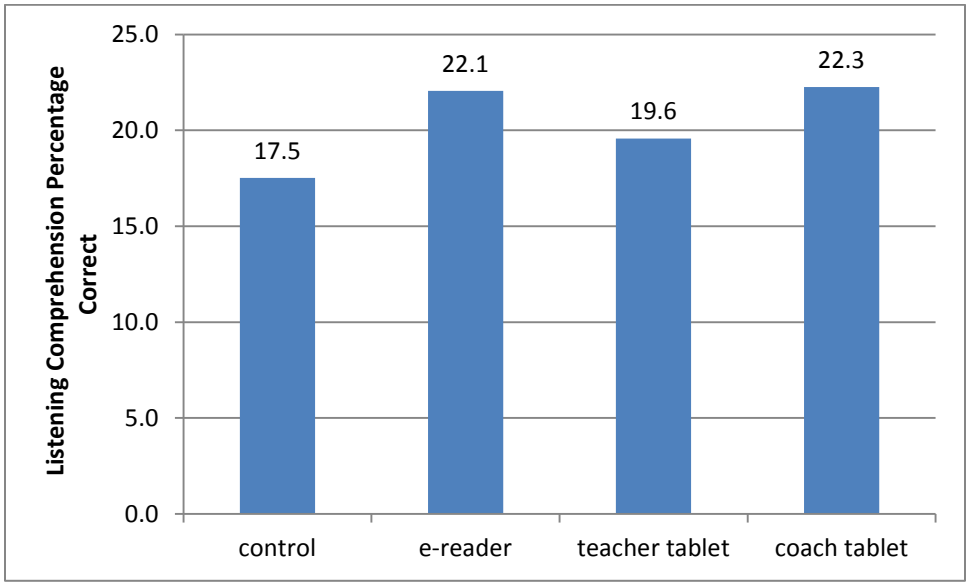
Listening comprehension

The listening comprehension subtask was administered in Kiswahili only. In this subtask, a story was read to a pupil and thereafter the pupil was asked five questions about the story. ***Figure 11*** shows the distribution of these scores by treatment type.

The average score for the control group was 17.5%. This score was the lowest, as compared to 19.6% for the teacher tablet group, 22.1% for the e-reader group, and 22.3% for the TAC Tutor tablet group. These differences, however, were statistically insignificant. Specifically, the slight differences between the control group and the e-reader group were insignificant ($p = 0.09$), the control group and teacher tablet groups were not statistically different ($p = 0.44$), and the difference between the control and the coach/TAC Tutor groups was insignificant ($p = 0.11$).

It is, however, worth noting that performance in listening comprehension was better than in reading comprehension in the same language. The significant difference between the two scores could be attributed to pupils' inability to read and the struggles that teachers in Kisumu County have in imparting basic reading skills to allow pupils to match their ability to interpret text to their ability to understand spoken Kiswahili.

Figure 11: Percentage Kiswahili listening comprehension scores, by treatment



Effects of Pupil Background on Performance

PRIMR's Kisumu ICT baseline data set also allowed for analysis of the relationships between pupil background and outcomes (measured by reading outcomes, with English oral reading fluency as the proxy outcome). ***Table 12*** summarizes the factors that are discussed below.

Table 12: Predictors—Pupil background

Predictor	Factor
What languages do you speak at school (Kiswahili)	7.1*
What languages do you speak at school (English)	9.4**
What languages do you speak at school (mother tongue)	(-) 6.1**
What languages do you speak at home (Kiswahili)	5.4*
Have electricity at home	6.0**
Have television at home	3.9*
Attended nursery / pre-unit	6.3*
How many days did you read at home last week	7.0**
I read aloud to the whole class	4.0*
I read aloud to a small group of students	2.9**
I read aloud to someone at home daily	4.6*
I talk with my family about what I am reading	2.4*
I read for fun outside school	3.7**
I read to find out things that I need to learn	5.0*
I would be happy if someone gave me a book as a present	4.7*

Predictor	Factor
I think reading is boring	(-) 4.1*
I need to read well so that I succeed in future	5.2*
I enjoy reading	5.6**

*$p < 0.05$, **$p < 0.01$.

Language spoken at school/home

Regarding pupil languages both at school and at home, pupils who said they spoke Kiswahili at school recorded a fluency score of 7.1 words per minute ($p = 0.01$) more than those who did not. Similarly, those who said they spoke English at school read more fluently by 9.4 words per minute ($p < 0.01$). However, speaking in mother tongue at school was observed to be negatively related with oral reading fluency, by 6.1 words per minute ($p < 0.01$). This result is surprising, given the policy for language use in Kenya.

The relationship between the languages pupils said they frequently spoke at home with reading fluency was also assessed. Pupils who spoke Kiswahili in their homes showed an additional fluency of 5.4 words per minute ($p = 0.04$).

Socioeconomic status

The data also revealed that the pupils' socioeconomic status affected performance in reading. As shown Table 12, pupils who reported that their families owned a television set scored 3.9 words per minute ($p = 0.03$) more than those without a TV, while those whose homesteads had electricity read 6.0 words per minute ($p < 0.01$) better than their counterparts.

The role of nursery or preschool

The effect on reading of attending a nursery or preschool/ pre-unit was analyzed. The Kisumu baseline data revealed a strong relationship between reading performance and preschool or nursery school. Attending nursery was associated with an additional 6.3 wpm ($p = 0.01$) in oral reading fluency.

Reading habits

The analysis of the Kisumu ICT baseline data revealed habits, perceptions, and opinions that were correlated with reading outcomes. It was observed that pupils who read at home (for at least one day in a week) read 7.0 words per minute more fluently than those who did not ($p < 0.01$), those who read aloud to the class read 4.0 wpm more fluently than those who did not ($p = 0.02$), those who read to a small group of pupils read 2.9 wpm more fluently than those who did not ($p < 0.03$), and those who read aloud to someone at home daily read 4.6 wpm more fluently than those who did not ($p < 0.02$).

It was also observed that pupils who talked with the family once or twice a week or on a daily basis about what they had read were 2.4 words per minute more fluent than those who did not ($p = 0.04$). Other statistically significant predictors included reading for fun outside school (3.7 wpm; $p < 0.01$) and reading to find out things (5.0 wpm; $p = 0.02$). Pupils who agreed a lot that

they would be happy if someone gave them a book as a present scored an additional 4.7 words per minute ($p < 0.02$) over those who did not, while those who felt that they needed to read well so that they can succeed in future scored 5.2 words per minute higher ($p < 0.01$) than those who did not.

A positive attitude toward reading was also observed to affect performance. Specifically, pupils who reported that they enjoyed reading read 5.6 wpm more fluently than those who did not ($p = 0.05$), while on the other hand, those who felt that reading was boring read 4.1 words per minute less fluently ($p = 0.02$) than those who did not.

Effects of School and Classroom Factors on Performance

Table 13 summarizes the statistically significant school and classroom factors that are discussed in this section.

Table 13: Predictors related to school characteristics

Predictor	Factor
Pupil has English textbook	1.8*
Pupil has Kiswahili textbook	2.7*
Have you received special training or taken courses in school management?	5.0*
How often are teacher's lesson plans reviewed? ≤ 1 month vs. ≤ termly	4.5*
How do you know whether your students are progressing? "Review of teacher report progress"	7.3*
How often did the SMC meet in this past year?	4.3*
SMC has decision making responsibility: "Review school budgets"	4.9*
SMC has decision making responsibility: "Raise funds"	3.6*
SMC has decision making responsibility: "Manage procurement/distribution of texts"	6.0*
School does not have a library	(-)4.3*
School does not have a computer room	(-)5.3*

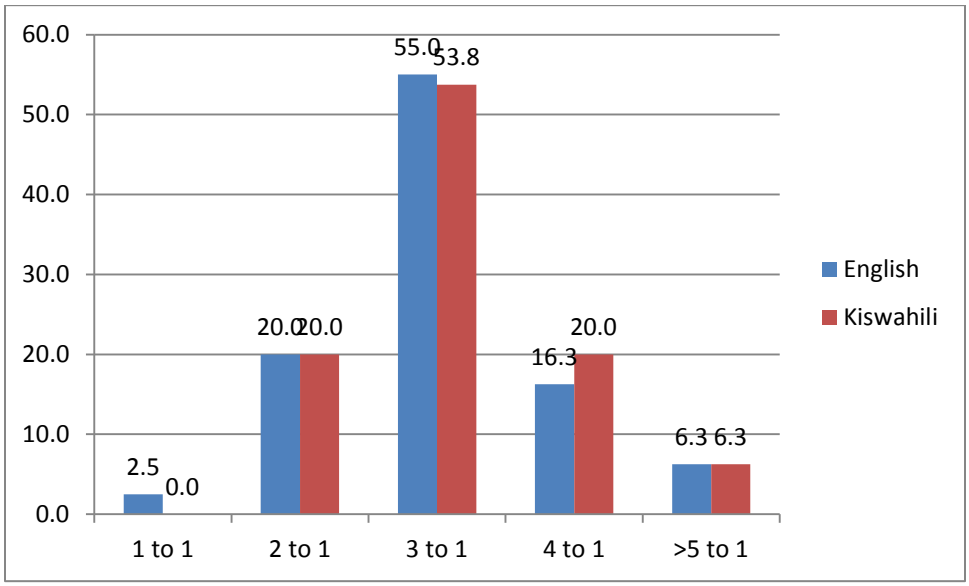
*$p < 0.05$.

School instructional materials

At risk of stating the obvious, textbooks are important aids in teaching and learning in schools. Worldwide and for some time, research has singled out availability of textbooks in schools and the number of these books, as defined by the pupil-textbook ratio, as being among the primary factors affecting education quality (MOE, 2007). The Kisumu data showed that oral reading fluency was correlated with having both an English and Kiswahili reading textbook to take home, with a positive relationship of 1.8 English words per minute ($p = 0.05$) and 2.7 Kiswahili words per minute ($p < 0.03$). Previous studies in Kenya have shown a stronger relationship.

The Kisumu ICT baseline data revealed that the pupil-textbook ratios in these schools were still high ***(Figure 12),*** despite several years' efforts to reduce it. It was observed that, for both English and Kiswahili, 80% of schools still had a pupil-textbook ratio of three pupils or more to one textbook. Almost none of the pupils enjoyed a 1:1 ratio, so few pupils were able to read and touch their own book.

Figure 12: Percentage of schools by pupil-textbook ratio



Head teacher factors

We were interested to know whether other nonpupil factors were correlated with pupil achievement. Our head teacher interview asked several items of the head teachers, and we found that many of these items (see Table 13) were correlated with outcomes in reading. These factors can be broadly categorized in terms of head teacher training, monitoring of pupil assessment, the role played by parents in schools, and the quality of school infrastructure.

Regarding training, the data showed that pupils in schools where the head teacher had received special training or had taken courses in school management read 5.0 wpm more fluently than pupils in schools without that advantage ($p = 0.05$). Related to this, head teachers and deputy head teachers have a role in reviewing teachers' lesson plans. On average, pupils in schools where head teachers reviewed lessons plans at an interval of less than one month read 4.5 words per minute more fluently than pupils in schools whose head teachers reviewed lesson plans once a term or not at all ($p = 0.03$).

Head teachers were also asked to state ways they used to measure pupils' progress in schools. Among the methods stated, review of teacher report progress proved to have a strong relationship with performance in reading. Pupils in schools where the head teacher used this method read 7.3 words per minute more fluently than their counterparts ($p = 0.01$).

Parents play an important role in the education system. They serve as the main accountability mechanism to the education process. In primary school, they engage with schools in two ways: (1) as individual parents/guardians to a pupil(s) in the school and (2) as group of parents forming the school management committee. The Kisumu ICT baseline data showed that the frequency of SMC meetings had a positive effect on outcomes. Table 12 above shows that pupils in schools where the SMC met more often (even at a frequency of less than once per month) had higher fluency rates by 4.3 words per minute ($p = 0.04$). The involvement of the SMCs in the review of school budgets was associated with 4.9 wpm higher fluency rates ($p = 0.04$), the SMC raising funds was associated with 3.6 words per minute ($p = 0.05$), and the SMC managing the procurement and distribution of books was associated with 6.0 wpm higher fluency ($p = 0.05$). Our interpretation of these findings is that the schools with greater involvement by the SMC are generally better governed, and have stronger support systems for teachers, which leads to better outcomes.

In terms of school infrastructure and as shown in Table 13, pupils in schools with libraries read 4.2 wpm more fluently than those without libraries ($p = 0.04$), and those in schools with computer labs had a superior oral reading fluency of 5.3 words per minute ($p = 0.03$).

Teacher factors

Teachers play a vital role in the education system. The Kisumu ICT baseline investigated the relationship between teacher assessment methods and education outcomes. ***Table 14*** shows which of these methods were statistically significantly related to baseline oral reading fluency rates. It was observed that in classrooms where results were used to inform parents orally, pupils read 3.4 wpm more fluently than those who did not use that method ($p = 0.03$). In classrooms where written assessments informed parents of progress, pupils read 5.5 wpm more fluently, on average ($p = 0.05$). It was also observed that in classrooms where teachers used results to decide on materials required in preparation of teaching aids, pupils read 11.6 wpm more fluently as compared to their counterparts ($p = 0.05$).

We asked teachers at what class level pupils should do particular tasks. Pupils in classrooms taught by teachers who thought that unfamiliar words should be taught *after* Class 1 read 4.8 wpm less fluently than those in classrooms where the teacher expected pupils to read unfamiliar words earlier ($p = 0.02$). Similarly, pupils whose teacher felt that they should understand stories read to them when in Class 3 and beyond read 4.2 wpm less than those whose teacher expected to them to understand at Class 2 or lower.

Table 14: Predictors related to teachers

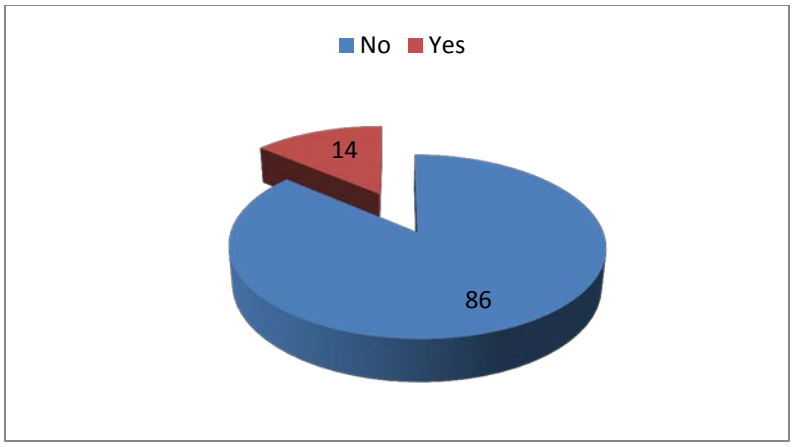
Predictor	Factor
What do you with written assessments/results? “Inform parents”	3.4*
What do you do with checking homework? “Inform head teacher/ parents”	5.5*
What do you do with oral assessments? “Decide on materials required”	11.6*
Class activities—Sound out unfamiliar words: Class 1 and below vs. Class 2 and above	(-) 4.8*
Class activities—Understand stories they hear: Class 2 and below vs. Class 3 and above	(-) 4.2*

*$p < 0.05$.

ICT in schools

The Kisumu baseline study specifically sought to collect information on the use of ICT in teaching and learning and its effect on learning outcomes in Class 2. As indicated in ***Figure 13,*** a majority of schools in this sample did not have a computer room. Further, only 14% of schools surveyed had any computers. Those that did have computers had an average of 1.8 computers per school.

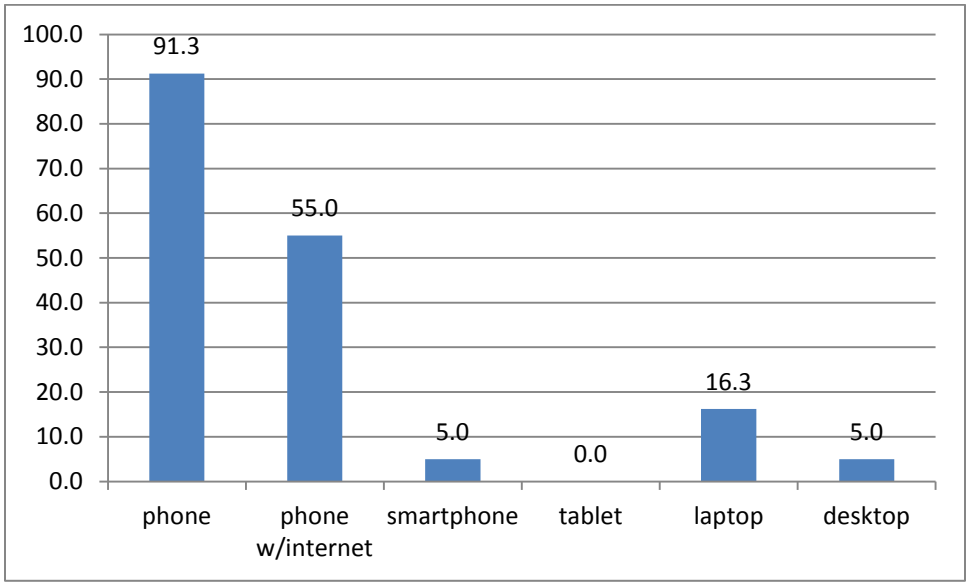
Figure 13: Percentage of schools with computer rooms



We also inquired whether schools had other technological devices apart from computers that were used in teaching Class 2. Only 2.5% of schools had laptops, and these were not typically used in teaching. The vast majority (92.5 %) had no technological devices and none had either tablets or e-readers.

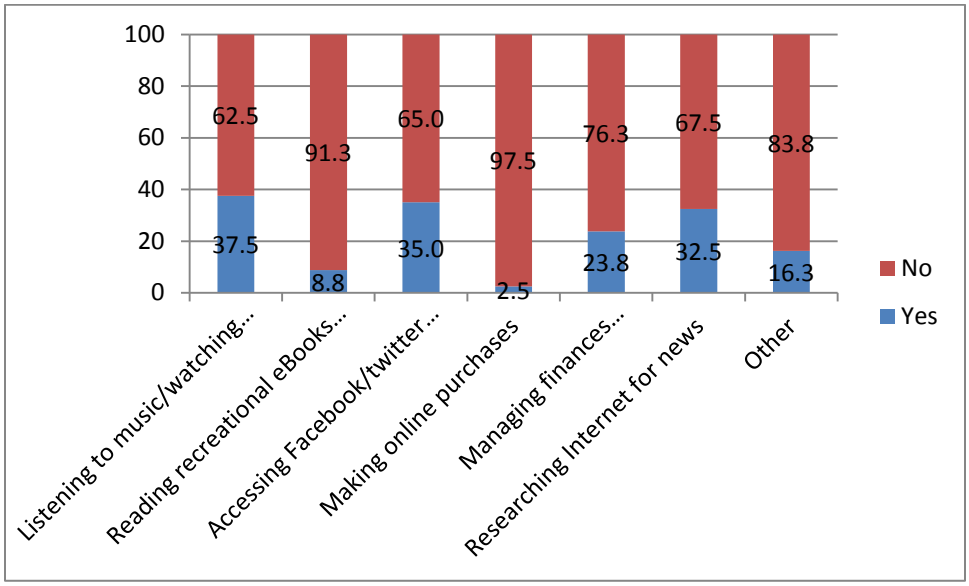
We also sought to know what technology devices head teachers personally owned. ***Figure 14*** shows that a majority of them owned phones (some of which were Internet enabled), but only 21.3% owned a computer (desktop or laptop).

Figure 14: Percentage of ownership of technology devices by head teachers



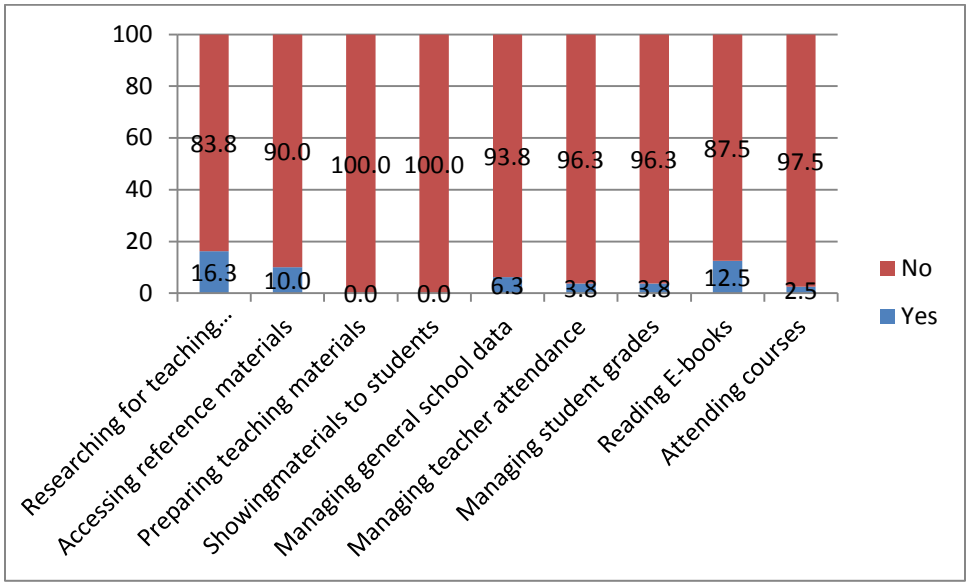
As observed in Figure 12, mobile phones were popular with head teachers. We also investigated how the phones were used. ***Figure 15*** shows that, apart from communication, phones were being used for entertainment. The primary purposes were listening to music/watching videos (37.5%); and accessing Facebook, Twitter, and other social media sites (35.0%). Researching on the Internet was observed among 32.5% of the head teachers.

Figure 15: Percentage of head teachers by personal use of phones



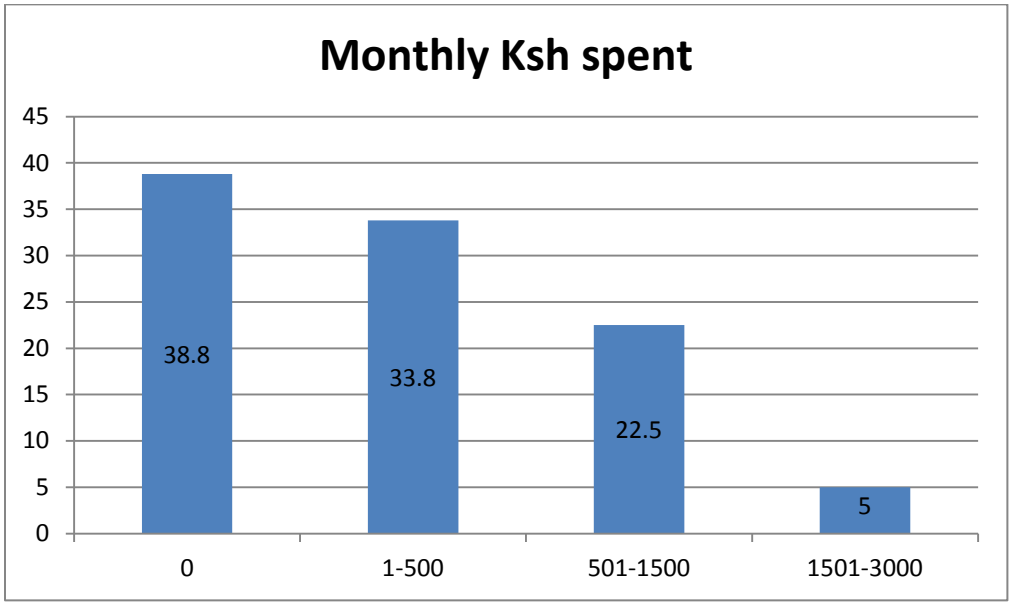
When asked about the professional use of phones ***(Figure 16),*** 16.3% of head teachers said they used phones for researching the Internet for reading materials, 12.5% said they read e-books, and 10% accessed reference materials.

Figure 16: Percentage of head teachers by professional use of phone



It was observed that head teachers in the county were spending an average of Kshs. 454 (minimum 0, maximum 3000) per month on Internet-enabled mobile phones and related devices. ***Figure 17*** shows the distribution of money spent on this expense monthly. It shows that more than 60% of teachers were spending money on internet enabled phones, and that more than one in four teachers was spending more than 500 Ksh monthly, a significant sum.

Figure 17: Percentage of head teachers and the amount spent on internet-enabled phones monthly



Our analysis of these head teacher and teacher data showed that few ICT tools were available to head teachers and teachers in Kisumu County, and that what equipment was available was

seldom used for instruction. These teachers and head teachers were not accustomed to interacting with ICT or improving instruction using ICT. This is a substantial concern for those interested in using ICT to improve outcomes, as a significant amount of training is needed for teachers and head teachers to use ICT well.

Conclusion and Recommendations

The Kisumu ICT baseline findings suggest several recommendations related to the quality of reading instruction in the county and how best to utilize ICT to improve pedagogical practice. These recommendations include the following:

- **Implement a large scale reading program in schools.** The baseline study found very low performance across all EGRA subtasks in English and Kiswahili. The highest performance in oral reading fluency was observed in pupils in zones randomly assigned to the TAC Tutor intervention group. For this group, the average fluency scores were 15.6 wpm in English and 13 wpm in Kiswahili. Unfortunately, this is only one third of the Kenyan benchmark of 65 wpm and 45 wpm. We therefore recommend the MOE implement a literacy program that allows children to increase their phonemic awareness, knowledge of alphabetic principle, fluency, vocabulary, and reading comprehension skills. This is necessary to overcome the barriers to reading that pupils face.
- **Train education managers in managing a reading program.** The baseline findings showed that pupils in schools where the head teacher had received special training in managing a reading program recorded a higher fluency score. We recommend that in-service training on reading be arranged and implemented continuously.
- **Improve access to reading materials.** The Kisumu ICT baseline findings indicated that a majority of schools had not attained the desired MOE pupil-textbooks ratio of 1:1. Previous EGRA studies have shown that access to reading materials improves reading outcomes. We therefore recommend a concerted effort to ensure that each pupil has access to reading textbooks and supplementary reading materials. Research shows that this type of access allows more rapid increases in reading outcomes.
- **Strengthen SMCs' involvement in schools.** The baseline findings showed a strong correlation between SMCs' participation in school management activities and learning outcomes. We therefore recommend that schools be encouraged and supported to embrace SMC participation in school planning and management activities, especially those directly linked to teaching and learning.
- **Design interventions with awareness of the ICT infrastructure in schools.** The baseline data showed that the assessed primary schools did not have the ICT infrastructure necessary for teaching and learning in the 21st century. Functional computers, the most common tool for ICT in schools, were available in less than 15% of schools. Most schools did not have a computer room, either. In order for schools like those in this study to realize the full impact of ICT, they will need special computer

rooms, electricity/solar connections, computers, and related technology such as projectors. Schools also must gain capacity to handle and maintain technological tools.

- **Prepare teachers and head teachers for ICT interventions.** Our findings showed that these teachers and head teachers did not have much experience with ICT. This is a concerning finding if ICT implementation is to be done through teachers and head teachers. Without training and support for integrating the ICT infrastructure with instructional activities, these activities will not be cost-effective. Careful teacher training will be necessary to adequately prepare them to use ICT to improve reading outcomes. We therefore recommend that the MOE first pilot-test the effects of various technologies on learning outcomes before scaling the ICT uptake to the national level, as PRIMR is currently doing with its pilot test on the effects of e-readers, teacher tablets, and coach/TAC Tutor tablets on reading. After a period of time with the ICT intervention, PRIMR will again collect reading data and then compare it to the baseline data to produce statistically reliable evidence on the most appropriate ICT intervention for primary schools. After this evidence is released, sustainable decisions on ICT investments can be made.

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Annex A: Research Tools/Instruments

1.1 EGRA Kiswahili Protocol

Uchunguzi wa Kusoma katika Madarasa ya Chini Nchini Kenya: Fomu ya Majibu ya Mwanafunzi
Maelekezo na Mwongozo wa Mchunguzi, (ICT Kisumu Baseline)

KISWAHILI

Maelekezo ya Jumla:

Wakati wa kufanya uchunguzi huu, ni muhimu kuonyesha mwelekeo wa kucheza na kuburudika na wanafunzi kwa kuanza kuzungumza nao juu ya maswala rahisi yatakayowapendeza (tazama mfano ulioko hapa chini). Mwanafunzi anapaswa kuchukulia uchunguzi huu kama mchezo wa kujifurahisha kuliko mtihani wa kuogopewa. Ni muhimu kusoma TU zile sehemu zilizo ndani ya visanduku pole pole na kwa ufasaha.

Hujambo! Jina langu ni ____ na ninaishi _____. Ningependa kukueleza kidogo kunihusu. (Mwambie kwa ufupi kuhusu familia yako, idadi ya watoto wako na umri wao, michezo upendayo, n.k.)

1. Hebu nieleze kwa ufupi kuhusu familia yako. (Ngojea jibu la mwanafunzi kwa muda mfupi. Ukiona kwamba anasita, uliza swali la pili; lakini asiposita, enda kwenye sehemu ya idhini ya Kusemwa.

2. Unapenda kufanya nini wakati haupo shuleni?

Idhini ya Kusemwa

- **Hebu nikueleze sababu za kuja kwangu hapa hivi leo. Ninafanya kazi na Wizara ya Elimu na tunafanya uchunguzi kuhusu jinsi wanafunzi hujifunza kusoma. Ulichaguliwa kushiriki kwa bahati, kama katika mchezo wa bahati nasibu.**
- **Tunakuomba ushirikiane nasi katika shughuli hii. Lakini usishiriki katika shughuli hii iwapo hutaki.**
- **Tutacheza mchezo wa kusoma. Nitakuuliza usome herufi, maneno na hadithi fupi kwa sauti.**
- **Nitatumia hii saa ya kasi ili kupima muda utakaotumia kusoma.**
- **Huu SIO mtihani na alama zako za mitihani shuleni hazitaathirika.**
- **SITAANDIKA jina lako po pote. Kwa hivyo, mtu hawezi kujua kwamba majibu haya ni yako.**
- **Kumbuka kwamba una hiari ya kutoshiriki katika shughuli hii. Vile vile, tutakapoanza shughuli hii, utajibu maswali kwa hiari yako na ni sawa iwapo hutaki kujibu swali.**
- **Je, una swali lo lote? Uko tayari kuanza?**

Tia alama ya sahihi ikiwa mwanafunzi ametoa idhini: ☐ ***NDIO***

(If verbal consent is not obtained, thank the child and move on to the next child, using this same form)

A. Date of Assessment :	Day : _____ Month:_____
B. Enumerator's Name :	
C. School Name :	
D. District:	
E. Zone:	
F. School Shift :	0 = Full day 1 = Morningonly 2 = Afternoononly
G. Multigrade Class ? :	0 = No 1 = Yes
H. Order of Assessment :	1 = First 2 = Second

I. Stream Name:	
J. Pupil Unique Code:	
K. Pupil's Age :	
L. Pupil's Gender :	0 = Boy 1 = Girl
M. Time Started :	____ : _____ AM / PM

KISWAHILI: Sehemu ya Kwanza: Ufahamu wa Sauti za Herufi

Mwonyeshe mwanafunzi orodha ya herufi iliyomo katika kijitabu cha mwanafunzi. Kisha sema ifuatavyo:

Karatasi hii ina herufi mbali mbali. Tafadhali zitamke sauti za herufi zote unazozijua.
Kwa mfano, sauti ya herufi hii *[kisha mwonyeshe herufi k)* **ni /k/**

Hebu tufanye mazoezi: Nitamkie sauti ya herufi hii ***[****mwonyeshe herufi A]****:*
Iwapo jawabu la mwanafunzi ni sahihi, sema **: Vyema, sauti ya herufi hii ni /a/**
Iwapo jawabu la mwanafunzi sio sahihi, sema: Sauti ya h**erufi hii ni /a/**

Sasa, hebu jaribu herufi nyingine: nitamkie sauti ya herufi hii *[mwonyeshe herufi m]****:***
*Iwapo jawabu la mwanafunzi ni sahihi, sema****:*** **Vyema, sauti ya herufi hii ni /m/**
Iwapo jawabu la mwanafunzi sio sahihi, sema: Sauti ya h**erufi hii ni /m/**

Je, umeelewa unavyopaswa kufanya?
Nikisema "Anza", tafadhali zitamke sauti za herufi hizi haraka iwezekenavyo lakini kwa makini. Nitamkie sauti za herufi, kuanzia hapa kisha kuendelea hivi. *[Elekeza kidole chako katika herufi ya kwanza katika mstari wa juu baada ya mfano kisha undelee hadi mwisho wa mstari huo].* **Nitanyamaza nikusikilize. Uko tayari? Anza.**

Anzisha saa ya kupimia kasi pindi mwanafunzi asomapo herufi ya mwanzo. Fuatiliza kusoma kwake ukitumia penseli kisha utie alama ya mkwaju (/) katika kila herufi ambayo hakuweza kuitamka. Iwapo, mwanafunzi anajisahihisha, jibu hilo ni sahihi. Iwapo ulikuwa umemkosoa mwanafunzi katika jibu ambapo alijisahihisha, tia alama ya duara (O) kwa herufi hiyo kisha uendelee. ***Unapaswa kukimya****, isipokuwa wakati unampa mwanafunzi majibu, ifuatavyo: Iwapo mwanafunzi anasita kwa muda wa sekunde 3, mpe jawabu halafu mwelekeze katika herufii inayofuata kisha umwambie "*

Tafadhali endelea *."Kisha utie alama ya kuonyesha hakupata jibu sahihi.*

BAADA YA SEKUNDE 60 SEMA, "Acha kusoma." Halafu tia alama ya mabano ( ]) katika herufii ya mwisho aliyosoma.
Kanuni ya kusitisha kusoma mapema: *Iwapo mwanafunzi hatapata jawabu sahihi hata moja katika mstari wote wa juu, hata kwa kujikosoa, sema "****Asante !****"Sitisha shughuli hii, kisha utie alama katika kisanduku kilicho chini ya ukurasa huu na uendelee na shughuli inayofuata.*

Mifano: k A m

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	
Z	u	g	a	m	a	d	M	O	t	*(10)*
S	th	n	N	B	I	R	k	U	T	*(20)*
I	A	h	l	k	a	w	A	O	a	*(30)*
E	f	n	A	l	a	W	K	Sh	a	*(40)*
L	o	a	w	gh	m	a	I	H	l	*(50)*
m	e	i	k	n	a	b	ch	Y	a	*(60)*
Dh	i	u	a	z	u	S	l	A	V	*(70)*
N	E	i	n	Y	I	e	D	I	a	*(80)*
I	U	t	Ny	a	I	a	u	M	N	*(90)*
Ng'	p	n	g	u	o	A	L	K	i	*(100)*

Muda uliosalia katika saa ya kupima kasi kufikia mwisho wa kusoma (idadi ya SEKUNDE) : ☐

Tia alama katika kisanduku hiki iwapo shughuli ya kusoma ilisitishwa kwa sababu mwanafunzi hakupata jawabu sahihi katika mstari wa kwanza. ☐

Sehemu ya Pili: Kutambua Maneno ya Kubuni

Muonyeshe mwanafunzi orodha ya maneno ya kubuni iliyomo ndani ya kijitabu cha mwanafunzi, halafu sema,

Karatasi hii ina maneno yaliyobuniwa. Ningependa usome maneno yote unayoweza. Kwa mfano, neno hili la kubuni ni: " ju"

Hebu tufanye mazoezi: tafadhali lisome neno hili *[mwonyeshe neno "huka"]*
[Iwapo mwanafunzi atasema "huka ", mwambie]: **"Vizuri sana : "huka"**
[Iwapo mwanafunzi hakusoma neno "huka" vizuri, mwambie]: **Neno hili la kubuni ni "huka."**

Sasa, hebu jaribu neno lingine la kubuni: Tafadhali soma neno lifuatalo *mwonyeshe neno:* **"fisa**".
*[Iwapo mwanafunzi atasema "*fisa *", mwambie]:* **"Vizuri sana : "fisa"**
[Iwapo mwanafunzi hakusoma neno "fisa" vizuri, mwambie]: **Neno hili la kubuni ni "fisa."**

Nikisema "Anza", yasome maneno haraka iwezekenavyo lakini kwa makini. Yasome maneno kutoka upande wa kushoto kuelekea upande wa kulia wa ukurasa huu, ukianzia mstari wa kwanza. Nitakimya nikusikilize, isipokuwa wakati unapohitaji usaidizi. Je, umeelewa jinsi unavyopaswa kufanya? Uko tayari? Anza.

Anzisha saa ya kupimia kasi pindi mwanafunzi asomapo neno la kwanza. Fuatiliza kusoma kwake ukitumia penseli kisha utie alama ya mkwaju (/) katika kila neno ambalo hakusoma vilivyo. Iwapo, mwanafunzi anajisahihisha, jibu hilo ni sahihi.Iwapo ulikuwa umemkosoa mwanafunzi katika jibu ambapo alijisahihisha, tia alama ya duara (O) kwa neno hilo kisha uendelee. ***Unapaswa kukimya****, isipokuwa wakati unampa mwanafunzi majibu, ifuatavyo: Iwapo mwanafunzi anasita kwa muda wa sekunde 3, mpe jawabu halafu mwelekeze katika neno linalofuata kisha umwambie "****Tafadhali endelea****."Kwa kila neno unalomsomea mwanafunzi, tia alama ya kuonyesha hakupata jibu sahihi.*

BAADA YA SEKUNDE 60 SEMA, "Acha kusoma." Halafu tia alama ya mabano (]) katika neno la mwisho alilosoma.
Kanuni ya kusitisha kusoma mapema: *Iwapo mwanafunzi hakusoma vilivyo maneno yote katika mstari wa kwanza, sema "****Asante !****", sitisha shughuli hii, kisha utie alama katika kisanduku kilicho chini ya ukurasa huu na uendelee na sehemu inayofuata.*

Mifano: ju huka fisa

1	*2*	*3*	*4*	*5*	
ngiso	fipe	mwela	hungu	ndaho	*(5)*
regu	ndise	Gazu	vube	nyuza	*(10)*
kabe	nzinga	Dhilu	yota	Josa	*(15)*
mtozo	vili	bwara	leye	howe	*(20)*
choyu	honzi	chuso	rime	Took	*(25)*
gowe	ripi	Nepu	mtofi	Shifi	*(30)*
thata	aate	Riki	kengu	ngute	*(35)*
nziki	msino	mbeta	sharu	Dusu	*(40)*
kenzi	kine	Kuvi	vicha	mapa	*(45)*
ndami	chena	Owa	ng'ila	Zefu	*(50)*

Muda uliosalia katika saa ya kasi kufikia mwisho wa kusoma (idadi ya SEKUNDE):

Tia alama katika kisanduku hiki iwapo shughuli ya kusoma ilisitishwa kwa sababu mwanafunzi hakupata jawabu sahihi katika mstari wa kwanza.

Sehemu ya Tatu (a): Kusoma Hadithi kwa Sauti

Mwonyeshe mwanafunzi hadithi iliyomo katika kijitabu cha mwananfunzi. Halafu sema hivi,

Hii hapa ni hadithi fupi. Ningependa uisome kwa sauti, haraka lakini kwa makini. Ukimaliza kuisoma, nitakuuliza maswali kuhusu yale uliyosoma. Je, umeelewa jinsi unavyopaswa kufanya? Nikisema "Anza," isome hadithi vizuri kadri ya uwezo wako. Nitanyamaza nikusilikilze. Uko tayari? Anza.

*Anzisha saa ya kupimia kasi pindi mwanafunzi asomapo neno la kwanza. Fuatiliza kusoma kwake ukitumia penseli kisha utie alama ya mkwaju (/) katika kila neno ambalo hakusoma vilivyo. Iwapo, mwanafunzi anajisahihisha, jibu hilo ni sahihi.Usiseme cho chote, isipokuwa wakati mwanafunzi atasita kwa muda wa sekunde 3 ambapo sasa utamsomea neno kisha umwonyeshe neno linalofuata na kumwambia"**Tafadhali endelea."** Kwa kila neno unalomsomea mwanafunzi, tia alama ya kuonyesha hakupata jibu sahihi.*
Baada ya sekunde 60 sema, "Acha kusoma." Halafu tia alama ya mabano ( ]) katika neno la mwisho alilosoma.
Kanuni ya kusitisha kusoma mapema: *Iwapo mwanafunzi hakusoma vilivyo maneno yote katika mstari wa kwanza, sema "**Asante !**", sitisha shughuli hii, kisha utie alama katika kisanduku kilicho chini ya ukurasa huu na uendelee na shughuli inayofuata.*

Sehemu ya Tatu (b). Kusoma na Kufahamu

*Baada ya kukamilika kwa sekunde 60 au Iwapo mwanafunzi atamaliza kusoma hadithi, **IONDOE hadithi kutoka mbele ya mwanafunzi**, kisha uulize swali la kwanza hapa chini.*

Mpe mwanafunzi hadi sekunde 15 alijibu swali, tia alama mwafaka kulingana na jibu lake, halafu uendelee katika swali linalofuata.

Soma maswali ya kila mstari hadi katika mabano yanayoonyesha mahala mwanafunzi alikomea kusoma.

HADITHI 1: MUMO APOTEA		**MASWALI**	**JIBU SAHIHI**	**JIBU LISILOSAHIHI**	**KUTOJIBU**
Mumo na mama yake wanaishi karibu na msitu.	8	**Mumo na mama yake wanaishi karibu na nini?** [na msitu]			
Mumo hupenda kucheza. Mama yake humwambia asicheze mbali na nyumbani.	18	**Mama yake humwambia nini?** [Asiende kucheza mbali na nyumbani]			
Siku moja, Mumo aliona ndege wa kupendeza akipita. Alimfuata mpaka msituni.	29	**Mumo alimfuata nani mpaka msituni?** [ndege/ndege wa kupendeza]			
Hakujua njia ya kurudi kwao. Aliketi chini	36	**Nini kinaonyesha Mumo alikuwa amechoka?** [aliketi chini; kulia; alishikwa na usingizi]			
ya mti na kuanza kulia. Baadaye alishikwa na usingizi akalala. Alipoamka, giza lilikuwa limeingia. Mara akaona taa kwa umbali. Watu wakaja. Wakamwona na kufurahi.	60	**Kwa nini watu walifurahi?** [Walimwona Mumo]			

Muda uliosalia katika saa ya kasi kufikia mwisho wa kusoma (idadi ya SEKUNDE):

Tia alama katika kisanduku hiki iwapo shughuli ya kusoma ilisitishwa kwa sababu mwanafunzi hakupata jawabu sahihi katika mstari wa kwanza.

Sehemu ya 4(a): Hadithi ya Kusikiza Ikisomwa

Mwonyeshe mwanafunzi hadithi iliyomo katika kijitabu chako. Halafu sema hivi,

Hii hapa ni hadithi fupi. Nitaisoma kwa sauti. Nitaisoma mara moja tu. Halafu nitakuuliza maswali. Tafadhali sikiliza kwa makini kisha ujaribu kujibu maswali. Je, umeelewa jinsi unavyopaswa kufanya? Uko tayari? Naanza.

Sehemu hii haitapimwa muda.

4b: Ufahamu wa Hadithi ya Kusikiza

Baada ya kusoma hadithi, muulize mwanafunzi maswali. Mpe mwanafunzi hadi sekunde 15 alijibu swali, tia alama mwafaka kulingana na jibu lake, halafu uendelee katika swali linalofuata. Soma maswali ya kila mstari hadi mwisho.

HADITHI 3: RIZIKI	**MASWALI**	**JIBU SAHIHI**	**JIBU LISILOSAHIHI**	**KUTOJIBU**
Riziki ni msichana anayependa kuchezacheza. Siku moja mwalimu alipoingia darasani wanafunzi walisimama na kumsalimia. Riziki akakiondoa kiti cha msichana mmoja aliyekuwa mbele yake. Yule msichana alipokuwa akikaa, alianguka chini. Wanafunzi wote wakacheka. Mwalimu akamuadhibu Riziki kwa kosa hilo. Riziki hakurudia hilo kosa tena.	**Msichana aliyependa kuchezacheza aliitwa nani?** [Riziki]			
	Riziki alifanya nini wakati wanafunzi waliposimama kumsalimia mwalimu? [Alikiondoa kiti cha mwanafunzi aliyekuwa mbele yake. Alitoa kiti]			
	Kwa nini wanafunzi walicheka? [Kwa sababu msichana alianguka chini, Walichukua kiti]			
	Kwa nini mwalimu alimwadhibu Riziki? [alisababisha kuanguka kwa mwenzake, aliondoa kiti cha mwenzake, alifanya kosa]			
	Je, unafikiri mwalimu alimuadhibu Riziki kwa njia gani? [Alipiga magoti, jibu lolote sahihi na kuadhibu]			

Sehemu ya Tano. Ufahamu wa Kujaza Pengo

Anzisha kifaa cha kupima mda wakati mwanafunzi anapolisoma neno la kwanza. ***Kaa kimya.*** *Iwapo mwanafunzi atakosea kwa maneno manne ya kwanza, Tafadhali msimamishe kusoma na uendelea na sehemu inayofuata.*

WAKATI MDA UNAPOKAMILIKA, SEMA " Wacha kusoma." Tia alama ya mabono ( ]) baada ya neno alilolitamka mwishi

Onyesha mwanafunzi ukurasa wa kwanza wa Hadithi. Kisha sema,

Katika hii sehemu, utasoma hadithi maalum. Hii hadithi ina pengo. Kila pengo linawezwa kujazwa na moja wapo ya maneno kati ya tatu uliyopewa. Unatakiwa kuchagua ni lipi kati ya haya maneno ambalo la faa zaidi kujaza kila pengo kisha uutie mviringo kwa hilo neno.

Tutaanza na hili jaribio (onyesha). Soma sentensi ya kwanza ki vyako ilihali nikiisoma kwa sauti.
Mimi naitwa Kanini.

Sasa nitasoma sentensi inayofuata.
Nyumbani kwetu tumepanda (ruka, miti, kikombe).

Neno *miti* **la faa saidi na hii hadithi. Chora mviringo kwa hili neno** *miti.* (Hakikisha kuwa mwanafunzi amechora mviringo kwa neno linalo stahili)

Sasa tusome sentensi inayofuata.
Nina Baba, (kimbia, tamka, mama) na ndugu wawili.

Ni neno lipi lafaa zaidi katika hii sentensi? (Sikiza).
(Iwapo ni sahihi): **Ndio, neno** *mama* **la faa zaidi na hii hadithi. Chora mviringo kwa hili neno** *mama.*
(Iwapo sio sahihi): **La. neno** *mama* **la faa zaidi na hii hadithi. Chora mviringo kwa hili neno** *mama.*

Sasa ningependa usome sentensi ya mwisho kisha uutie mviringo kwa neno lenye la faa zaidi katika hii sentensi. Soma haraka iwezakanavyo. Soma sentensi kisha utie mviringo kwa neno linalofaa. (Mpe mwanafunzi mda wa kusoma sentensi na wa kutia mviringo kwa neno linalofaa).

Neno *sokoni,* **ni sahihi. Iwapo ulitia mviringo kwa neno lingine, kwa jibu lako na utie mviringo kwa neno** *sokoni.*

Ambia mwanafunzi afungue ukurasa unaofuata. Nitakaposema "anza," soma maneno haraka iwezekanavyo. Ufikapo kwenye maneno matatu yaliyoekwa kwa mabano, tia mviringo kwa neno lililo sahihi. Nitanyamaza nikiku sikiza, labda kama unahitaji usaidizi. Je, umeelewa chenye unapaswa kufunya? Uko tayari? Anza.

1.2 EGRA Kiswahili Stimuli

KENYA EARLY GRADE READING ASSESSMENT

Student Stimuli Booklet

Kiswahili

(ICT Kisumu Baseline)

USAID | KENYA
FROM THE AMERICAN PEOPLE

Mifano: k A m

Z	u	g	a	M	a	d	M	o	t
s	th	n	N	B	i	R	k	u	T
i	A	h	l	K	a	w	A	O	a
e	f	n	A	ɭ	a	W	K	sh	a
l	o	a	w	gh	m	a	l	h	ɭ
m	e	i	k	n	a	b	ch	y	a
Dh	i	u	a	z	u	S	ɭ	A	V
n	E	i	n	Y	i	e	D	i	a
i	U	t	Ny	a	i	a	u	m	N
Ng’	p	n	g	u	o	A	L	k	i

Mifano: ju huka fisa

ngiso	fipe	mwela	hungu	ndaho
regu	ndise	gazu	vube	nyuza
kabe	nzinga	dhilu	yota	josa
mtozo	vili	bwara	leye	howe
choyu	honzi	chuso	rime	toko
gowe	ripi	nepu	mtofi	shifi
thata	aate	riki	kengu	ngute
nziki	msino	mbeta	sharu	dusu
kenzi	kine	kuvi	vicha	mapa
ndami	chena	owa	ng’ila	zefu

Mumo na mama yake wanaishi karibu na msitu. Mumo hupenda kucheza. Mama yake humwambia asicheze mbali na nyumbani. Siku moja, Mumo aliona ndege wa kupendeza akipita. Alimfuata mpaka msituni. Hakujua njia ya kurudi kwao. Aliketi chini ya mti na kuanza kulia. Baadaye alishikwa na usingizi akalala. Alipoamka giza lilikuwa limeingia. Mara akaona taa kwa umbali. Watu wakaja. Wakamwona na kufurahi.

1.3 Kiswahili Maze for Pupils

School Name_____Six letter ID_____

Mimi naitwa Kanini.
Nyumbani kwetu tumepanda **(ruka, miti, kikombe)**. Nina Baba, **(kimbia, tamka,mama)** na ndugu wawili. Mama yangu huuza matunda **(sokoni,cheka, jembe).**

Karani anaishi na wazazi wake kijijini. **(Mlima,Kula, Wazazi)** wake hawana pesa za kununua nguo za shule. Walikutana na mama mmoja tajiri. **(Kulala, Huyo, Hii)** mama akawaeleza kuwa anaweza kununua nguo za **(kanisa, kulima, shule)** na vitabu. Mama tajiri akasema, ilikuwa ni lazima Karani aishi naye **(kwake, juu, rangi)** jijini. Yeye hakujaliwa kupata **(mbuzi, kuimba, mtoto).** Wazazi wa Karani walifurahi sana. Wakaamua kuwa, ingekuwa vyema Karani **(simba, aishi, hapo)** na yule mama tajiri. Hawakujua kuwa, yule mama alimtaka Karani **(twende, awe, mchuzi)** mfanyikazi wake. Kazi ya Karani ilikuwa **(jembe, kumsaidia, kumkimbilia)** nyumbani. Kila siku, Karani aliamka mapema **(kuita, kutafuta, isipokuwa)** maji. Alitamani kucheza na kwenda shule kama **(watoto, mti, kila)** wengine. Yule mama tajiri alitaka afanye kazi tu.

Likizo ilipofika, wazazi wa Karani walienda jijini **(shamba, kumuona, pinga)** mtoto wao. Walipofika, walimuona Karani akiwa **(na, la, chupa)** huzuni. Karani alikuwa amevaa **(lia, nguo,picha)** chafu sana. Mama yake akawa **(ni, na, huyo)** huzuni kubwa. Karani alipowaona wazazi **(kikombe, wewe, wake),** alianza kulia. Aliwauliza kwa nini walitaka **(awe, mimi, yake)** mfanyikazi. Wazazi wake wakashangaa. Mama ya Karani alitokwa **(mguu, na, ni)** machozi.

2.1 EGRA English Protocol

Kenya Early Grade Reading Assessment: Student Response Administrator Instructions and Protocol (ICT Kisumu Baseline)

ENGLISH

General Instructions

It is important to establish a playful and relaxed rapport with the children to be assessed, via some simple initial conversation among topics of interest to the child (see example below). The child should perceive the following assessment almost as a game to be enjoyed rather than an exam. It is important to read ONLY the sections in boxes aloud slowly and clearly.

Good morning. My name is ____ and I live in _____. I'd like to tell you a little bit about myself. [Number and ages of children; pets; sports; etc]

1. Could you tell me a little about yourself and your family? [*Wait for response; if student is reluctant, ask question 2, but if they seem comfortable continue to verbal consent*].

2. What do you like to do when you are not in school?

Verbal Consent

- **Let me tell you why I am here today.I work with the Ministry of Education and we are trying to understand how children learn to read. You were picked by chance, like in a raffle or lottery.**
- **We would like your help in this. But you do not have to take part if you do not want to.**
- **We are going to play a reading game. I am going to ask you to read letters, words and a short story out loud.**
- **Using this stopwatch, I will see how long it takes you to read.**
- **This is NOT a test and it will not affect your grade at school.**
- **I will also ask you other questions about your family, like what language your family uses at home and some of the things your family has.**
- **I will NOT write down your name so no one will know these are your answers.**
- **Once again, you do not have to participate if you do not wish to. Once we begin, if you would rather not answer a question, that's all right.**
- **Do you have any questions? Are you ready to get started?**

Check box if verbal consent is obtained: ☐ ***YES***

(If verbal consent is not obtained, thank the child and move on to the next child, using this same form)

A. Date of Assessment :	Day : _____ Month:_____
B. Enumerator's Name :	
C. School Name :	
D. District:	
E. Zone:	
F. School Shift :	0 = Full day 1 = Morning only 2 = Afternoon only
G. Multigrade Class ? :	0 = No 1 = Yes
H. Order of Assessment :	1 = First 2 = Second

I. Stream Name:	
J. Pupil Unique Code:	
K. Pupil's Age :	
L. Pupil's Gender :	0 = Boy 1 = Girl
M. Time Started :	____ : _____ AM / PM

Section 1. Letter Sound Knowledge

Show the child the sheet of letters in the student stimuli booklet. Say:

Here is a page full of letters of the English alphabet. Please tell me the SOUNDS of as many letters as you can; not the NAMES of the letters, but the SOUNDS.
For example, the sound of this letter *[point to A]***is "AH" as in "APPLE".**
Let's practise: Tell me the sound of this letter ***[****point to V]:***
If the child responds correctly say: **Good, the sound of this letter is "VVVV."**
*If the child does not respond correctly, say:***The sound of this letter is "VVVV."**
Now try another one: Tell me the sound of this letter *[point to L]:*
If the child responds correctly say: **Good, the sound of this letter is "LLL."**
*If the child does not respond correctly, say:***The sound of this letter is "LLL."**
Do you understand what you are to do?
When I say "Begin," please sound out the letters as quickly and carefully as you can. Tell me the sound of the letters, starting here and continuing this way. *[Point to the first letter on the row after the example and draw your finger across the first line].***If you come to a letter sound you do not know, I will tell it to you. If not, I will keep quiet and listen to you. Ready? Begin**.

 *Start the timer when the child reads the first letter. Follow along with your pencil and* ***clearly*** *mark any incorrect letters with a slash (/). Count self-corrections as correct.If you've already marked the self-corrected letter as incorrect, circle the letter and go on.* ***Stay quiet,*** *except when providing answers as follows: if the child hesitates for 3 seconds, provide the sound of the letter, point to the next letter and say "****Please go on****." Mark the letter you provide to the child as incorrect. If the student gives you the letter name, rather than the sound, provide the letter sound and say: ["****Please tell me the SOUND of the letter****"]. This prompt may be given only once during the exercise.*

AFTER 60 SECONDS SAY, "stop." Mark the final letter read with a bracket (]).
Early Stop Rule: *If you have marked as incorrect all of the answers on the first line with no self-corrections, say "****Thank you!****" discontinue this exercise, check the box at the bottom, and go on to the next exercise.*

*Example :*Av L

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	
d	i	R	E	T	N	t	y	s	n	*(10)*
v	o	E	A	H	g	B	h	u	R	*(20)*
l	t	Q	Y	S	a	I	m	o	a	*(30)*
t	U	H	E	K	w	b	W	h	z	*(40)*
I	H	t	E	O	l	E	n	M	p	*(50)*
G	P	r	H	L	i	w	A	e	o	*(60)*
N	C	n	O	S	O	L	J	T	o	*(70)*
s	A	c	E	X	m	s	D	F	r	*(80)*
i	d	i	R	E	f	s	t	s	e	*(90)*
E	a	e	T	U	a	n	a	r	e	*(100)*

Time remaining on stopwatch at completion (number of SECONDS) : ☐

Check this box if the exercise was discontinued because the child had no correct answers in the first line. ☐

Section 2.Inventedword decoding

Show the child the sheet of invented words in the student stimuli booklet. Say,

Here are some made-up words. I would like you to read as many as you can. Do not spell the words, but read them. For example, this made-up word is: "lut".

Let's practise: Please read this word*[point to the next word:* **dif***].*
*[If the student says "dif", say]:***"Very good: "dif"**
*[If the student does not say "dif" correctly say]:***This made-up word is "dif."**

Now try another one: Please read this word *[point to the next word:***mab***].*
*[If the student says "mab", say]:***"Very good: "mab"**
*[If the student does not say "mab" correctly say]:***This made-up word is "mab."**

When I say "begin," read the words as quickly and carefully as you can. Read the words across the page, starting at the first row below the line. I will keep quiet and listen to you, unless you need help. Do you understand what you are to do? Ready? Begin.

Start the timer when the child reads the first word. Follow along with your pencil and clearly mark any incorrect words with a slash (/). Count self-corrections as correct. If you've already marked the self-corrected wordas incorrect, circle the word and go on. ***Stay quiet,*** *except when providing answers as follows: if the child hesitates for 3 seconds, provide the word, point to the next word and say "****Please go on****." Mark the word you provide to the child as incorrect.*

AFTER 60 SECONDS, SAY"Stop." Mark the final word read with a bracket (]).
Early Stop Rule:*If you have slashed/marked as incorrect all of the answers on the first line, say "****Thank you!****" discontinue this exercise, check the box at the bottom, and go on to the next exercise.*

*Example :*lut dif mab

1	*2*	*3*	*4*	*5*	
git	ret	gat	lep	shik	*(5)*
zay	vob	bis	cur	zin	*(10)*
zeg	yot	jol	reb	kan	*(15)*
pab	vap	kom	dix	tep	*(20)*
gux	lal	pim	kar	ving	*(25)*
lop	fem	het	wim	jeb	*(30)*
pog	chup	heg	fik	ruk	*(35)*
mak	mip	wis	wog	sab	*(40)*
dap	mep	yut	thon	whib	*(45)*
pug	fal	bem	zil	nob	*(50)*

Time remaining on stopwatch at completion (number of SECONDS) : ☐

Check this box if the exercise was discontinued because the child had no correct answers in the first line. ☐

Section 3a. Oral passage reading

Show the child the story in the student stimuli booklet. Say,

Here is a short story. I want you to read it aloud, quickly but carefully. When you have finished, I will ask you some questions about what you have read.Do you understand what you are to do? When I say "begin," read the story as best as you can. I will keep quiet & listen to you, unless you need help. Ready? Begin.

Start the timer when the child reads the first word. Follow along with your pencil and clearly mark any incorrect words with a slash (/). Count self-corrections as correct. ***Stay quiet,*** *unless the child hesitates for 3 seconds, in which case provide the word, point to the next word and say "****Please go on****." Mark the word you provide to the child as incorrect.*
At 60 seconds, say "Stop." Mark the final word read with a bracket ( ]).
Early stop rule: *If the child reads no words correctly on the first line, say "****Thank you!****", discontinue this exercise, check the box at the bottom of the page, and go on to the next exercise.*

Section 3b. Reading comprehension

When 60 seconds are up or if the child finishes reading the passage in less than 60 seconds, ***REMOVE the passage from in front of the child****, and ask the first question below.*

Give the child at most 15 seconds to answer the question, mark the child's response, and move to the next question.

Read the questions for each line up to the bracket showing where the child stopped reading.

Now I am going to ask you a few questions about the story you just read. Try to answer the questions as well as you can.

Story 1: A NEW DRESS		**QUESTIONS**	**CORRECT RESPONSE**	**INCORRECT RESPONSE**	**NO RESPONSE**
Anna went to the shop to buy a new dress.	10	**Why did Anna go to the shop?** [to buy a new dress]			
She saw dresses with many colours.	16	**What types of dresses did Anna see at the market? [**Dresses of different colors; beautiful dresses; many dresses.]			
She did not know which one to buy. Anna looked and looked. All the dresses were too big. She started to walk home.	39	**Why did she start to walk home?** [She did not find a dress, the dresses were too big, she was tired, it was getting late]			
Anna ran into the next shop because it began to rain.	50	**Why did Anna run into the shop?** [Because it started raining.]			
She saw a very nice dress. She smiled	58	**How do we know Anna liked the dress?** [She smiled, she bought the dress.]			
and bought it.	61				

Time remaining on stopwatch at completion (number of SECONDS): ☐

Check this box if exercise stopped due to no correct answers in the first line. ☐

Section 4.Maze comprehension

Show the pupil the first page of the Maze assessment. Say,

For this activity, you will read a special kind of story. Some of the words in the story have been replaced with a group of three words. You are to decide which word in each group fits best in the story. You will circle the word you think is best.

We will begin with the practice story here (point). Read the first sentence to yourself while I read it out loud.

The bird landed on the ground.

Now I will read the next sentence.

It picked up a piece of (book, grass, tired).

The word *grass* **fits best with the rest of the story. Draw a circle around the word** *grass.*
(Check to be sure that the students have circled the correct word.)

Let's read the next sentence.

The bird flew back to its (nest, car, yell).

Which word fits best in the sentence? (Listen to the pupil).
(If correct): **Yes, the word** *nest* **fits best with the rest of the story. Draw a circle around the word** *nest.*
(If incorrect): **No. Actually, the word** *nest* **fits best with the rest of the story. Draw a circle around the word** *nest.*

For the last sentence, I want you to read it yourself and circle the word that fits best in the sentence. Work quickly, but not so fast that you make mistakes. Now read the sentence and circle the word. (Allow time for the pupil to read the sentence and circle the word).

The word *tree,* **is correct. If you circled another word, cross out your answer and circle** *tree.*

Tell the pupil to turn over the page. When I say "begin," read the words as quickly and carefully as you can. Whenever you see a group of words, circle the correct answer. I will keep quiet and listen to you, unless you need help. Do you understand what you are to do? Ready? Begin.

Start the timer when the child reads the first word. ***Stay quiet.*** *If the pupil gets the first four items wrong, please stop them and continue to the next section.*

AFTER THE TIMER GOES RED, SAY "Stop." Mark the final word attempted with a bracket ( ]).

Section 5. Pupil Context Interview

Ask each question verbally to the child, as in an interview. Do not read the response options aloud. Wait for the child to respond, and then write this response in the space provided, or circle the code of the option that corresponds to the child's response. If there is no special instruction to the contrary, only one response is permitted.

1a	What language(s) do you speak at school? *[Multiple responses are allowed]*	Kiswahili .....1 English…… 2 Mother Tongue……..……..3 (Specify): ..... Do not know/No response……..……..9			
1b	What language do you speak at home? *[Multiple responses are allowed]*	Kiswahili .....1 English…… 2 Mother Tongue……..……..3 (Specify): ..... Do not know/No response……..……..9			
		No	***Yes***	***Don't Know***	***No response***
2	Do you have a radio at your house?	0	1	8	9
3	Do you have a telephone or mobile phone at your house?	0	1	8	9
4	Do you have electricity at your house?	0	1	8	9
5	Do you have a television at your house?	0	1	8	9
6	Do you have a refrigerator at your house?	0	1	8	9
7	Do you have a toilet inside your house?	0	1	8	9
8	Do you have a bicycle at your house?	0	1	8	9
9	Do you have a motorcycle at your house?	0	1	8	9
10	Do you have a car, truck, 4 by 4, tractor, or engine boat at your house?	0	1	8	9
11	Did you go to any school before Class 1? (nursery, pre-unit, baby class)	No.....0 Yes .....1 Do not know/No response……..……..9			
12	What class were you in last year?	Pre-school .....0 Class 1 .....1 Class 2……..2 Not in school.....3			

		Do not know/No response……..……..9
13	Last year, were you absent from school for more than one week?	No.....0 Yes .....1 Do not know/No response……..……..9
14	Do you have the English reading textbook at home?	No.....0 Yes .....1 Do not know / No response.....9
15	Do you have the Kiswahili reading textbook at home?	No.....0 Yes .....1 Do not know / No response.....9
16	Do you have the maths textbook at home?	No.....0 Yes .....1 Do not know / No response.....9
17	Did you read at home last night? ***[If No or Don't Know Skip to 20]***	No.....0 Yes .....1 Do not know / No response.....9
18	What sort of reading material did you read last night?	Open response_____
19	What language was the material you read in #18 above written in?	English.....1 Kiswahili .....2 Dholuo……..3 Luhya.....4 Other……..……..…5 Specify_____
20	Do you have other books or reading materials at home? ***[If No or Don't Know Skip to 22]***	No.....0 Yes .....1 Do not know / No response.....9
21	*[If yes to Question 20]* What language(s) are these books or other materials in? *[Multiple- responses are allowed]*	Kiswahili……..1 English.....2 Mother Tongue.……..3 (Specify): .....

		Do not know / No response 9
22	How many days did you read a book at your house last week?	1 day.....1 2 days.....2 3 days.....3 4 days.....4 5 days.....5 6 days.....6 7 days.....7
23	Does someone read to you at home? ***[If No or Don't Know Skip to 25]***	No.....0 Yes .....1 Do not know / No response. 9
24	Who reads to you at home?	No one.....0 Mother .....1 Father.....2 Older relative.....3 Sibling.....4 Do not know / No response 9
25	Can your mother read and write?	No.....0 Yes .....1 Do not know / No response 9
26	Can your father read and write?	No.....0 Yes .....1 Do not know / No response 9

In your school, how often do these things happen?

	Frequency	***Every Day or almost every day***	***Once or twice a week***	***Once or twice a month***	***Never or almost never***
27	I read aloud to the whole class	4	3	2	1
28	I read aloud to a small group of students in my class	4	3	2	1
29	I read silently on my own	4	3	2	1

	How often do you these things outside school				
	Frequency	**Every Day or almost every day**	**Once or twice a week**	**Once or twice a month**	**Never or almost never**
30	I read aloud to someone at home	4	3	2	1
31	I listen to someone at home read aloud at me	4	3	2	1
32	I talk with my friends about what I am reading	4	3	2	1
33	I talk with my family about what I am reading	4	3	2	1
34	I read for fun outside of school	4	3	2	1
35	I read to find out things I want to learn	4	3	2	1

	What do you think about reading? Tell me how much you agree with each of the following statements.				
	Rating	**Agree a lot**	**Agree a little**	**Disagree a little**	**Disagree a lot**
36	I read only if I have to	4	3	2	1
37	I like talking about books with other people	4	3	2	1
38	I will be happy if someone gave me a book as a present	4	3	2	1
39	I think reading is boring	4	3	2	1
40	I need to read well so that I succeed in the future	4	3	2	1
41	I enjoy reading	4	3	2	1

OK we are done! You have done a good job. Go back to your classroom, and please do not talk to other pupils about what we have done today.

2.2 EGRA English Stimuli

KENYA EARLY GRADE READING ASSESSMENT

Student Stimuli Booklet
English

ICT KISUMU BASELINE

Example : A v L

d	i	R	E	t	N	t	y	s	n
v	o	E	A	h	g	B	h	u	R
l	t	Q	Y	s	a	l	m	o	a
t	U	H	E	k	w	b	W	h	z
l	H	t	E	o	l	E	n	M	p
G	P	r	H	l	i	w	A	e	o
N	C	n	O	S	O	L	J	T	o
s	A	c	E	x	m	s	D	F	r
i	d	i	R	e	f	s	t	s	e
E	a	e	T	u	a	n	a	r	e

Example : lut dif mab

git	ret	gat	lep	shik
zay	vob	bis	cur	zin
zeg	yot	jol	reb	kan
pab	vap	kom	dix	tep
gux	lal	pim	kar	ving
lop	fem	het	wim	jeb
pog	chup	heg	fik	ruk
mak	mip	wis	wog	sab
dap	mep	yut	thon	whib
pug	fal	bem	zil	nob

Anna went to the shop to buy a new dress. She saw dresses with many colours. She did not know which one to buy. Anna looked and looked. All the dresses were too big. She started to walk home. Anna ran into the next shop because it began to rain. She saw a very nice dress. She smiled and bought it.

2.3 English Maze for Pupils

School Name_____Six Letter ID_____

The bird landed on the ground. It picked up a piece of (**book, grass, tired**). The bird flew back to its (**nest, car, yell**). The nest was in the big (**foot, rip, tree**).

Jane does not like to do homework. When she gets home from school (**cat, she, fly**) only wants to play. Jane tells (**table, her, red**) mother that a full day of (**scary, school, house**) and homework is too much! Her (**hen, to, mother**) tells Jane she needs to do (**her, book, run**) homework before playing. Jane tells her (**goat, mother, work**) that she is just a little (**child, leg, three**), so she needs more time to (**eats, hat, play**).

One day, Jane decides she will (**under, never, dog**) do homework again. She does not (**bring, throw, with**) her books home from school anymore. (**She, Class, Jump**) feels that she is on a (**shop, holiday, on**). Jane is happy. After two full (**weeks, chairs, up**), she takes her exams. Jane gets (**dirty, ear, poor**) marks. Her mother is very angry, (**and, in, hot**) Jane is very sad. She cries (**to, for, walk**) a long time.

Her big brother (**on, pulls, comes**) to see her. She tells him (**in, pen, about**) her homework and her very poor (**marks, pigs, fear**). The brother tells her that doing (**shirt, have, homework**) will help her a lot. Now, (**box, run, Jane**) knows that homework can help her (**get, drink, bus**) good marks. She now wants to (**fall, work, pink**) hard and do her homework.

3.0 Teacher Interview

Teacher Questionnaire
ICT Kisumu Baseline Survey, 2013
KENYA

- The Ministry of Education and RTI International are collaborating in a study to better understand how children learn. Your school was selected through a process of statistical sampling. We would like your help in giving us some information. But you do not have to take part if you do not want to.
- Your name will not be recorded on this form or mentioned anywhere in the survey data. The results of this survey will be published in the form of collective tables. The information acquired through this instrument will be shared with the Ministry of Education with the hope of identifying areas where additional support may be needed.
- The name of your school and the class level and class you teach will be recorded, but only so that we can correctly link school, class, and student data so as to analyze relationships between children's learning and the characteristics of the settings in which they learn. Your school's name will not be used in any report or presentation. The results of analysis will be used by the Ministry of Education and RTI to help identify additional support that is needed.
- If you agree to help with this study, please read the consent statement below, check the "Yes" box, and answer the questions in this questionnaire as completely and accurately as you can, regarding your teaching preparation and activities. It should take you no more than 10 minutes. Return the completed form to the study team before the team leaves your school.
- If after reading this message you prefer not to participate, please return this form with no markings to the study team.

CONSENT STATEMENT: I understand and agree to participate in this research study. ☐ *YES*

Please answer all questions truthfully. Write each response in the space on the right across from each item. Where response options are given, clearly circle the number on the far right of the option that corresponds most closely to your response.

1	Date of interview	☐ **January , 2013**	
2	Which subjects does the teacher teach to the Class from question 2a? *[Multiple responses are allowed]*	English ☐ Kiswahili ☐	
3	Name of District		
4	Name of Zone		
5	Name of School		
6	Supervisor's Name		
7	Your gender:	Male ..... 0 Female 1	
8	Enrolment of your class (indicate numbers by gender)	Number of boys:	
		Number of girls:	

9	Your age at last birthday (years)	_____ years
10	What is your highest professional qualification/ training?	Untrained teacher .....0 P1 ..... 1 Diploma / S1 ..... 2 Bachelors' of Education ..... 3 Other (specify:_____)..... 4
11	How many years have you taught at this school?	_____ years
12	How many years have you been teaching overall?	_____ years
13	Does your school have a Library?	No..... 0 Yes..... 1 Don't know 9
14	Does your school have a Parent / Teacher Association which meets regularly?	No..... 0 Yes..... 1 Don't know 9
15	Approximately, how long do you take to travel to school?	Stay within the school compound.....0 15 minutes or less ..... 1 16 to 30 minutes ..... 2 31 to 45 minutes ..... 3 46 to 60 minutes ..... 4 More than 60 minutes 5
16	How often does a head teacher, TAC tutor or District official observe you teaching in your classroom?	Never ..... 0 About once per week..... 1 About once per month..... 2 About once per term..... 3 About once per year 4
17	How many days of in-service training or professional development sessions on **any topic** have you attended during the last 3 years? If none put a "zero"	Days:_____
18	How many days of in-service training or professional development sessions on teaching **Kiswahili** have you attended during the last 2 years? If none put a "zero"	Days:_____
19	How many days of in-service training or professional development sessions on teaching **English** have you attended during the last 2 years? If none put a "zero"	Days:_____
20	[If Teacher attended trainings in questions 17-19] What was the most useful aspect of those trainings?	

Which of the following methods do you use to measure your pupils' reading progress? Indicate how often you use each method by circling the number on the right that corresponds to the closest frequency:

	Never	**1 day a week**	**2 days a week**	**3 days a week**	**4 days a week**	**5 days a week**

21	Written assessments	0	1	2	3	4	5
22	Oral evaluations	0	1	2	3	4	5
23	Checking of exercise books	0	1	2	3	4	5
24	Checking of homework	0	1	2	3	4	5
25	Other methods (please describe):						

	Instructions: Only complete the column for the subjects the teacher teaches. *(Kiswahili or English*). Many teachers teach all three.		
		English (a)	**Kiswahili (b)**
26	Write the title of the main textbook used for each subject:	…… …… I don't have the Textbook……..8 ***Skip to 29***	…… …… I don't have the Textbook……..8 ***Skip to 29***
27	How often do you use the text mentioned in Q29 during the lessons?	Never……0 One day per week ……1 Two days per week ……2 Three days per week ……3 Four days per week……4 Five days per week …… 5	Never……0 One day per week ……1 Two days per week ……2 Three days per week ……3 Four days per week……4 Five days per week …… 5
28	How useful do you find this Text?	Not useful …… 1 A little bit useful …… 2 Somewhat useful …… 3 Useful …… 4 Very useful ……5	Not useful …… 1 A little bit useful …… 2 Somewhat useful …… 3 Useful …… 4 Very useful ……5
29	Do you have a teacher's guide for:	No ……0 **Skip to 31** Yes ……1	No ……0 **Skip to 31** Yes ……1
30	How useful do you find this guide?	Not useful …… 1 A little bit useful …… 2 Somewhat useful …… 3 Useful …… 4 Very useful ……5	Not useful …… 1 A little bit useful …… 2 Somewhat useful …… 3 Useful …… 4 Very useful ……5
31	Please show me the scheme of work for this subject	Doesn't have it……1 Not well prepared……2 Reasonably well prepared……3 Well prepared……4 Refuses/No response……9	Doesn't have it……1 Not well prepared……2 Reasonably well prepared……3 Well prepared……4 Refuses/No response……9
32	Please show me the lesson plan for this subject	Doesn't have it……1 Not well prepared……2 Reasonably well prepared……3 Well prepared……4 Refuses/No response……9	Doesn't have it……1 Not well prepared……2 Reasonably well prepared……3 Well prepared……4 Refuses/No response……9

	Following are different activities you might do with your pupils during a lesson. Think about the last 5 school days and indicate how often each of the following activities took place, by circling the number on the right that corresponds to the closest frequency:	Never	1 day a week	2 days a week	3 days a week	4 days a week	5 days a week
33	The whole class repeated sentences that you said first.	0	1	2	3	4	5
34	Pupils copied down text from the chalkboard.	0	1	2	3	4	5
35	Pupils retold a story that they read.	0	1	2	3	4	5
36	Pupils sounded out unfamiliar words.	0	1	2	3	4	5
37	Pupils learned meanings of new words.	0	1	2	3	4	5
38	Pupils read aloud to teacher or to other pupils.	0	1	2	3	4	5
39	Pupils were assigned reading to do on their own during school time.	0	1	2	3	4	5

	In what class should pupils FIRST be able to demonstrate these skills?	Before class 1	class 1	Class 2	Class 3	Class 4 or later
40	Read aloud a short passage with few mistakes	0	1	2	3	9
41	Write name	0	1	2	3	9
42	Understand stories they read	0	1	2	3	9
43	Recognize letters and say letter names	0	1	2	3	9
44	Sound out unfamiliar words	0	1	2	3	9
45	Understand stories they hear	0	1	2	3	9
46	Recite alphabet	0	1	2	3	9

	ICT Section	
47	Do you have a smart phone or an internet enabled phone?	No..... 0 Yes..... 1 Don't know 9
48	Do you have an active email address?	No..... 0 Yes..... 1 Don't know 9
49	Do you email your colleagues at school?	No..... 0 Yes..... 1
50	Do you email your friends and family?	No..... 0 Yes..... 1
51	How often do you check your email?	Never.....0 Daily..... .....1 Weekly..... .....2 Monthly.....3

52	Do you have a tablet or Ipad? ***(If No skip to 54)***	No..... 0 Yes..... 1 Don't know 9
53	Does your tablet or Ipad access the internet?	No..... 0 Yes..... 1 Don't know 9
54	Do you use technology tools to improve instruction?	No..... 0 Yes..... 1
55	Which technology tools do you use to improve instruction? (Multiple responses allowed)	Mobile phone ……1 Tablet…… ……1 Internet…….. .....1 Others ……1 Specify_____
56	How comfortable are you with technology?	Not comfortable at all…… 1 Somewhat uncomfortable…… 2 Comfortable…… 3 Very comfortable…… 4

Thank you for your participation! You have been very helpful.

4.0 Head Teacher Interview

Head Teacher Questionnaire
ICT Kisumu Baseline Survey
KENYA

- The Ministry of Education and RTI International are collaborating in a study to better understand how children learn. Your school was selected through a process of statistical sampling. We would like your help in giving us some information. But you do not have to take part if you do not want to.
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- The name of your school and the class level and class you teach will be recorded, but only so that we can correctly link school, class, and student data so as to analyze relationships between children's learning and the characteristics of the settings in which they learn. The results of analysis will be used by the Ministry of Education and RTI to help identify additional support that is needed.
- If you agree to help with this study, please read the consent statement below, check the "Yes" box, and answer the questions in this questionnaire as completely and accurately as you can, regarding your teaching preparation and activities. It should take you no more than 10 minutes. Return the completed form to the study team before the team leaves your school.

  If after reading this message you prefer not to participate, please return this form with no markings to the study team.

CONSENT STATEMENT: I understand and agree to participate in this research study. ☐ *YES*

Please answer all questions truthfully. Write each response in the space on the right across from each item. Where response options are given, clearly circle the number on the far right of the option that corresponds most closely to your response. For example, (3)

1	Name of District	
2	Name of Zone	
3	Name of School	
4	Supervisor Name	
5	Day and Month	____ **January 2013**
6	Your gender	Male …… 0 Female ……1
7	What is your position at this school?	Head Teacher …… 1 Deputy Head teacher …… 2 Other …… 3
8	How many years have you been in this position (as a head teacher or the deputy head teacher)	Years: _____
9	What is your highest level of education?	Graduate ……1

		Approved Teacher Status ……2 Diploma …… 3 PI ……4 PII ……5 Other, (specify}: _____
10	How many hours a week do you teach? (Put zero if none)	Hours: _____ **If ZERO, GO TO QUESTION 12**
11	What Classes do you teach? *(Multiple responses allowed – Circle all that apply)*	Pre Primary……0 Standard 1 ……1 Standard 2 ……2 Standard 3 ……3 Standard 4 ……4 Standard 5 ……5 Standard 6 ……6 Standard 7 ……7 Standard 8 ……8
12	How many hours, per week, do you provide instructional support for your teachers?	Hours: _____
13	Have you received specialized training in any area or taken courses in school management in the last 12 months?	Yes ……1 No ……0 **IF NO, GO TO QUESTION 16**
14	If yes, what was the length of the program?	_____Days
15	Who initiated this training for you?	MoE invited me ……1 City Council/Municipal council …… 2 I initiated it ……3 Program/Project/Donor …… 4 Other, (Specify) _____
16	Have you received special training or taken courses preparing you to implement a program in lower primary level reading in the last 12 months?	Yes ……1 No ……0 **IF NO, GO TO QUESTION 19**
17	If yes, what was the length of the program?	_____Days
18	Who organized this training?	MoE invited me ……1 City Council/Municipal council ……2 I initiated it ……3 Program/Project/Donor ……4 Other, (Specify): _____5
19	Have you supported teachers on how to teach reading in lower primary?	Yes ……1 No ……0
20	Are you satisfied with the performance in reading 2 in your school?	Not satisfied at all ……1 Satisfied ……2 Very satisfied ……3

21	In the last month, on how many days did you have to leave the school during the school day on official school business? (Enter Zero if none)	Days: _____
Information about the school		
22	What is the highest class taught in this school?	Standard _____
23	Does your school use Kiswahili as the medium of instruction for Class 1 and 2?	Yes .....1 No 0
24	Approximately what percentage of actual instruction in Class 1and 2 is in Kiswahili?	_____Percent
25	Why does your school not use more Kiswahili in instruction in class 1 and 2?	Explain: _____ _____ _____
26	In your personal view, what should be the appropriate class to begin teaching in English?	Standard 0 .....0 Standard 1 .....1 Standard 2 .....2 Standard 3 .....3 Standard 4 4
27	How many of the teachers have received specific training on teaching reading? (Enter Zero if none)	Number of teachers: _____ ***IF ZERO GO TO QUESTION 29***
28	Who organized this training? *(Multiple-responses allowed)*	MoE ……1 City Council/Municipal council ……2 School…… …… 3 Program/Project/Donor …… 4 District……5 Other, (Specify): _____
29	Since the start of the current school year, was this school closed during the regular school calendar other than holidays?	Yes .....1 No .....0 ***GO TO QUESTION 32***
30	If yes, how many days was the school closed?	Number of days: _____
31	If yes, why was the school closed?	Teacher strike……1 Student strike / Parent strikes…… ……2 Insecurity…. … …… 3 Severe Weather…… …… 4 Other, (Specify): _____
32	How many teachers were absent yesterday?	Number of teachers absent: _____ Don't know ……99
33	How many teachers arrived after the start of classes yesterday?	Number of teachers late: _____ Don't know ……99
34	Who is responsible for reviewing teachers' lesson plans?	No one ……0 ***IF NO ONE, GO TO QUESTION 36*** head teacher ……1

		Deputy head teacher ……2 Other ……3 Other, (specify):_____
35	How often are these plans reviewed?	Never ……0 Once per year ……1 Once every 2-3 months ……2 Once every month ……3 Once every two weeks …… 4 Every week ……5 Once per day ……6 Don't Know/No Responses ……99
36	In your school, who is responsible for observing and supervising teachers in their classrooms?	No one observes ……0 ***IF NO ONE, GO TO QUESTION 38*** Head Teacher ……1 Deputy Head Teacher ……2 Other ……3 If other, specify:_____
37	In a term, how often are you able to observe the teachers in their classrooms?	Never …… 0 One time ……1 Two times ……2 Three Times ……3 Four or more times ……4 If other, specify:_____
38	How do you know whether your students are progressing? ***[DO NOT READ RESPONSES - CIRCLE ALL THOSE MENTIONED]***	Yes Classroom observation …… 1 Monitor students' results on tests given by teachers……2 Evaluate children orally myself ……3 Review children's assignments or Homework ……4 Teachers provide me progress reports ……5 Other ……6 If other, specify:_____ Don't know/refuse to respond …… 7
39	Who provides pupils' textbooks in **Kiswahili** for class 1 & 2? **[CIRCLE ALL THOSE MENTIONED]**	Yes MoE ……1 City /Municipal council ……2 School (via independent funds)……3 Parents (individually) ……4 School Committee or board……5 Other, (specify): _____ 6 Don't know/refuse to respond …… DK
40	What is the approximate student to book ratio for **Kiswahili** in Class 1 and 2	1 to 1……1 2 to 1……2 3 to 1……3 4 to 1……4 5 to 1 or more……5 No books……8 Doesn't know/refuses to respond……DK

41	Who provides pupils' textbooks in **English** for class 1 & 2? **[CIRCLE ALL THAT IS MENTIONED]**	MoE ……1 City /Municipal council ……2 School (via independent funds)……3 Parents (individually) ……4 School Committee or board……5 Donors……6 Other, (specify): _____ 7 Don't know/refuse to respond …… DK
42	What is the approximate student to book ratio for **English** in Class 1 and 2	1 to 1……1 2 to 1……2 3 to 1……3 4 to 1……4 5 to 1 or more……5 No books……8 Doesn't know/refuses to respond……99
43	How often did the P.T.A. meet in this past year?	Never ……0 once a year ……1 once a term ……2 once a month ……3 once a week …… 4 doesn't know/no response ……99 School does not have a PTA (skip to Q45)……88
44	For which of the following does the PTA have decision making authority and/or responsibility? **[CIRCLE ALL THAT APPLY]** **[DON'T READ ALL THE POSSIBLE RESPONSES. SIMPLY CIRCLE ALL RESPONSE GIVEN]**	Discuss school Management problems? …… 1 Discuss students' problems and solutions?..... 2 Review progress of school Improvement efforts? ……3 Review financial situation (budgets) of the school ……4 Manage school infrastructure and Equipment? ……5 Discuss school curriculum?.....6 Raise funds ……7 Manage procurement or Distribution of textbooks? ……8 don't know/no response ……9
45	Is there clean, safe water supply available on school premises?	Yes ……1 No ……0
46	Does the school have electricity?	Yes ……1 No ……0
47	Does the school have a feeding program?	Yes ……1 No ……0
48	Does the school have separate girls' washroom facilities?	Yes ……1 No ……0
49	Does the school have a library?	Yes ……1 No ……0

	ICT Section	
50	Does the school have a computer room?	Yes ……1 No ……0
51	Which of the following ICT facilities does your school have?	Computers……1 Tablets……2 Ipad……3 PDAs……4 Others……5 Specify……
52	Which ICT facilities do your Class 2 pupils use?	Computers……1 Tablets……2 Ipad……3 PDAs……4 Others……5 Specify……
53	During training, how many pupils share a computer	Not Applicable……0 One……1 Two……2 More than Two……3
54	Do you have a smart phone or an internet enabled phone?	No…… 0 Yes…… 1 Don't know …… 9
55	Do you have an active email address?	No…… 0 Yes…… 1 Don't know …… 9
56	Do you email your colleagues at school?	No…… 0 Yes…… 1
57	Do you email your friends and family?	No…… 0 Yes…… 1
58	How often do you check your email?	Never……0 Daily…… ……1 Weekly…… ……2 Monthly……3
59	Do you have a tablet or Ipad? ***(If No skip to 61)***	No…… 0 Yes…… 1 Don't know …… 9
60	Does your tablet or Ipad access the internet?	No…… 0 Yes…… 1 Don't know …… 9
61	Do you use technology tools to improve instruction?	No…… 0 Yes…… 1

62	Which technology tools do you use to improve instruction? (Multiple responses allowed)	Mobile phone ……..1 Tablet…… ……1 Internet…….. .....1 Others ……..1 Specify_____
63	How comfortable are you with technology?	Not comfortable at all…….. 1 Somewhat uncomfortable…… 2 Comfortable…….. 3 Very comfortable…… 4

Thank you for your participation! You have been very helpful.

5.0 Reading Classroom Observation and Inventory

Classroom Observation – Early Grade Reading

COR1 District:	
COR2 Zone	
COR3 School:	
COR4 Supervisor Name:	
COR5 Coordinator:	
COR6: English or Kiswahili lesson?:	English …… 1 Kiswahili…… 2

The observation form should be completed in class during a reading lesson. If the teacher indicates that there is not a separate When arriving to class, find a seat at the back of the class. Try not to interrupt or disturb the class.

Complete the observation table. Every three minutes, indicate the teacher focus, teacher content, student and teacher action, and teaching material used at the moment of observation. In sections A and B indicate the teacher focus and teacher content by placing an "X" by the observed item. In sections C and D, indicate the teacher and student action and the language being used by placing the appropriate language code by the observed action. In section E, indicate the material and the langauge being used by placing the appropriate language code by the material used at the moment of observation. Every section (A, B, C, D, and E) must have at least one mark for each "Snapshot". Don't forget to write in the time of the beginning of the observation.

After the observation is complete, answer the following questions:

	In order to get a sense of the number of textbooks available please ask the children to hold up the textbook for the curr					
COR7	Number of children with text book for current subject					
COR8	Does the teacher have a book for this class?	Yes	1	No	0	
COR9	If yes, ask the teacher to show you the Text Book [Eng, swahili Maths he or she is using					
COR10	How many chapters/lessons has the class covered so far this year?					
COR11	How many chapters/lessons are there in this book?					
COR12	Start time ----------Hr……..Min **AM/PM**					

NOTES:

			Observation #:											COR
			3	6	9	12	15	18	21	24	27	30	33	
		A) Teacher focus: (only one X)												
13	COR13	Whole class												
14	COR14	Small Group												
15	COR15	One individual student												
16	COR16	Other / Not focusing on students												
17	COR17	Teacher not in the room												
		B) Instructional Content: (only one X)												
18	COR18	Letters and letter sounds												
19	COR19	Spelling												
20	COR20	Grammar												
21	COR21	Reading isolated words												
22	COR22	Reading sentences												
23	COR23	Vocabulary (word meanings)												
24	COR24	Writing/dictation												
25	COR25	Reading texts												
26	COR26	Reading comprehension – text												
27	COR27	Writing – creating texts												
28	COR28	Other or don't know												
		C) Teacher Action (Languge) (E=English; K=Kiswahili; O=Other)												
29	COR29	Reading out loud												
30	COR30	Writing												
31	COR31	Explaining												
32	COR32	Speaking												
33	COR33	Listening to student(s)												
34	COR34	Monitoring students												
		D) Student actions (Language) (E=English; K=Kiswahili; O=Other)												
35	COR35	Choral reading												
36	COR36	Individual reading out loud												
37	COR37	Silent reading												
38	COR38	Writing on paper or individual slate												
39	COR39	writing on blackboard												
40	COR40	Speaking												
41	COR41	Listening to/watching the teacher												
42	COR42	Repeating/Recitation												
43	COR43	Other (Projects, games, etc....)												
44	COR44	Off task (talking, sleeping, playing)												
		E) Materials used (Language) (E=English; K=Kiswahili; O=Other)												
45	COR45	Blackboard												
46	COR46	Textbook												
47	COR47	Other book												
48	COR48	Papers (worksheets or photocopies)												
49	COR49	Flashcards												
50	COR50	Posters/Wall charts												
51	COR51	Slates												
52	COR52	Student notebooks												
53	COR53	Other												

54	COR54	Is the classroom clean and neat?	No . . . . . 0 Yes 1
55	COR55	Is there sufficient light in the room?	No . . . . . 0 Yes 1
56	COR56	Is there a ceiling?	No . . . . . 0 Yes 1
57	COR57	Are there students sitting on the floor? How many?	None ..... 0 A few ..... 1 About half ..... 2 Almost all ..... 3 All 4

58	COR58	Are there sufficient chairs/desks for all the students?	No . . . . . 0 Yes 1
59	COR59	Are all the desks designed for one or two students?	No . . . . . 0 Yes 1
60	COR60	Is there enough space in the class for the teacher to circulate freely?	No . . . . . 0 Yes 1
61	COR61	Indicate what desk or bench arrangement is used in this classroom	Rows …….. 0 small groups …….. 1 circle…… 2 other (describe) …….. 3
62	COR62	How many boys are present in this classroom at the time of your observation? **[HAVE ALL THE BOYS STAND AND COUNT THEM]**	Boys ☐☐
63	COR63	How many girls are present in this classroom at the time of your observation? **[HAVE ALL THE GIRLS STAND AND COUNT THEM]**	Girls ☐☐
	Materials **[ASK CHILDREN TO RAISE EACH TYPE OF MATERIAL IN THE AIR ONE BY ONE]**:		
64	COR64.1	Number of children with **exercise book**	☐☐
65	COR64.2	Number of children with **pen/ pencil**	☐☐
	COR66	Does the teacher have the following materials?	
66	COR66.1	**[CIRCLE ALL THE MATERIALS THAT THE TEACHER HAS]**	Chalkboard…….. 1
67	COR66.2		Whiteboard…… 1
68	COR66.3		Chalk/Markers for blackboard/whiteboard 1
69	COR66.4		Pen/Pencil…….. 1
69	COR66.5		Notebook…….. 1
70	COR66.6		Teacher Manual (current subject) 1
71	COR71	***[If there is a chalkboard]*** Is the chalkboard in good condition?	No . . . . . 0 Yes 1
		Are the following materials available/accessible (not locked away) for children to read?	
72	COR72	Books/booklets other than textbooks	None …….. 0 1-4…….. 1 5-9 . . . . . 2 10-19 …….. 3 20-39 …….. 4 40+ 5
73	COR73	Magazines	None …….. 0 1-4…….. 1 5-9 . . . . . 2 10-19 …….. 3 20-39 …….. 4 40+ 5
74	COR74	Are there posters on the walls	No . . . . . 0 Yes 1
75	COR75	Are there posters specifically about health and/or safety?	No . . . . . 0 Yes 1
76	COR76	Are there teacher made displays/resources visible?	No . . . . . 0 Yes 1
77	COR77	Is students' work displayed on the walls?	No . . . . . 0 Yes 1
78	COR78	Ending Time	☐☐ : ☐☐ (AM / PM)