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The DRC 2015 Early Grade Reading Assessment, Early Grade Mathematics Assessment, and Snapshot of School Management Effectiveness—Report of Lessons Learned, Revised

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Abbreviations

ALP	Accelerated Learning Program
ACCELERE!	ACCEs-Lectures-Retention and Accountability (ACCEs-LEcture-Retention et redevabilité)
CENADEP	National Center for Development Support and Popular Participation (*Centre National d'Appui au Développement et à la Participation Populaire*)
cwpm	correct words per minute
DRC	Democratic Republic of the Congo
EAGLE	Empowering Adolescent Girls to Lead Through Education
EdData	Education Data for Decision Making
EGMA	Early Grade Mathematics Assessment
EGRA	Early Grade Reading Assessment
MEPS-INC	Ministry of Primary and Secondary Education and Initiation to New Citizenship (Le Ministère de l'Enseignement Primaire, Secondaire et Initiation à la Nouvelle Citoyenneté)
ORF	oral reading fluency
RFTOP	Request for Task Order Proposals
SMS	short messaging service
SSME	Snapshot of School Management Effectiveness
USAID	U.S. Agency for International Development

1 Background[1]

This study intended to provide the U.S. Agency for International Development (USAID) and the Government of the Democratic Republic of the Congo (DRC) with information regarding the ability of Grade 3 children to read in three of the DRC's national languages (Lingala, Kiswahili, and Tshiluba), those same pupils' receptive and productive oral French skills, and Grade 5 children's ability to read in French. Other elements of the study provide insight into the numeracy skills of Grade 3 children in one district in Katanga as well as the French reading and numeracy skills of Grade 3 pupils in the Accelerated Learning Programs (ALPs).[2] The study also provides background context and data related to key pupil, teacher, head teacher, and school variables that are hypothesized to be good predictors of pupil performance in early grade reading and mathematics. This study provides a baseline measure of pupil performance and school and classroom contextual and pedagogical practices for the USAID ACCEs-Lectures-Retention and Accountability (ACCELERE!, ACCEs-LEcture-Retention et redevabilité) project in the DRC. In addition, this diagnostic information intends to help policymakers make data-informed decisions regarding remediation strategies that can improve the quality of instruction and pupil learning outcomes in early primary grades.

This report focuses on practical lessons learned from the implementation of these assessments that may be helpful for further assessments in the DRC and elsewhere.

The Early Grade Reading Assessment instrument for the DRC

The Early Grade Reading Assessment (EGRA) was used to measure the language, pre-reading, and reading skills of pupils in the DRC. EGRA is an individually and orally administered assessment that has been used in other USAID projects across Sub-Saharan Africa and elsewhere. In Grade 3, each pupil was administered the assessment in the mother tongue language identified for that province; each Grade 3 pupil was also administered the three Oral Vocabulary subtasks in French (as shown in ***Table 1***). Administering the EGRA instrument in the two languages to each pupil took approximately 45 minutes.

In Grade 5, EGRA was administered in French only, which reduced the testing time per pupil to approximately 20 minutes.

Table 1 summarizes the EGRA subtasks that were administered within this project, also indicating the language that was assessed by each subtask.

Table 1. EGRA instrument subtasks in DRC

Subtask	Skill	Description: The child is asked to…
Receptive Oral Language Grade 3: 3 National Languages and French Grade 5: French	Vocabulary	…point to a common object in the environment when told the name of that object orally; …place an object in a location as instructed.

[1] Background section drawn from the USAID | East Africa solicitation, *Education Evaluation Services in the DRC Under the EdData II BPA*. (2014, March). RFTOP # SOL-660-14-000003.
[2] Because the ALP sample was relatively small (12 schools), we did not disaggregate all of the ALP data.

Subtask	Skill	Description: The child is asked to…
Productive Oral Language Grade 3: 3 National Languages and French Grade 5: French	Oral language vocabulary	…verbally identify the name of an object when shown an image of that object on a piece of paper.
Letter Name or Sound Recognition Grade 3: 3 National Languages Grade 5: French	Knowledge of the alphabet and the names and sounds of both uppercase and lowercase letters	…say the names of letters or sounds of the letters, while looking at a printed page of 100 letters of the alphabet in random order, upper and lower cases. (*Timed subtask*)
Familiar Words Reading Grade 3: 3 National Languages Grade 5: French	Ability to read a randomly presented list of frequently occurring words by sight or automatically	…read a list of common words. (*Timed subtask*)
Non-Word Reading Grade 3: 3 National Languages Grade 5: French	Alphabetic principle (letter-sound correspondence and fluency) automatic decoding	…read a list of 50 non-words printed on a page. Words were constructed from actual orthography, but were not real words. (*Timed subtask*)
Oral Reading Grade 3: 3 National Languages Grade 5: French	Fluency (automatic word reading in context)	…read out loud a grade-level-appropriate short story printed on a page. (*Timed subtask*)
Reading Comprehension Grade 3: 3 National Languages Grade 5: French	Comprehension	…verbally respond to five questions that the assessor asks about the short story. (*Untimed subtask*)

The Early Grade Mathematics Assessment instrument for the DRC

In addition, mathematics skills of Grade 3 pupils in one district in Katanga were assessed. The Early Grade Mathematics Assessment (EGMA) was not administered to any Grade 5 pupils. To do so, the EGMA, which is also an individually administered assessment, was used. Administering the EGMA to Grade 3 pupils in this district increased the total testing time to at least an hour per pupil. ***Table 2*** summarizes the subtasks of the EGMA designed for this study.

Table 2. EGMA instrument subtasks in DRC

Subtask	Skill	Description: The child is asked to…
	Subtasks that assess more procedural (recall) type knowledge	
Addition and Subtraction Level 1 (basic facts)	This subtask requires knowledge of and confidence with basic addition and subtraction facts. It is expected that pupils should develop some level of automaticity and fluency with these facts because they need them throughout mathematics.	…mentally solve addition and subtraction problems with sums and differences less than 20. *The problems ranged from those with only single digits to problems that involved bridging* 10*. There were 10 items per addition and subtraction subtask.* (*Timed subtask*)
	Subtasks that assess more conceptual (application) type knowledge	
Quantity Discrimination (number comparison)	This subtask requires the ability to make judgments about differences by comparing quantities represented by numbers.	…identify the larger of a pair of numbers. *The number pairs used ranged from a pair of single-digit numbers to five pairs of double-digit numbers and four pairs of three-digit numbers. There were 10 items.* (*Untimed subtask*)

Subtask	Skill	Description: The child is asked to…
Missing Number (number patterns)	This subtask requires the ability to discern and complete number patterns.	…determine the missing number in a pattern of four numbers, one of which is missing. *Patterns used included counting forward and backward by ones, fives, tens, and twos. There were 10 items.* (*Untimed subtask*)
Addition and Subtraction Level 2*	This subtask requires the ability to use and apply the procedural addition and subtraction knowledge assessed in the Level 1 subtask to solve more complicated addition and subtraction problems.	…solve addition and subtraction problems that involve the knowledge and application of the basic addition and subtraction facts assessed in the Level 1 subtask. *Pupils were allowed to use any strategy that they wanted, including the use of paper and pencil supplied by the administrator. The problems extended to the addition and subtraction of two-digit numbers involving bridging. There were five items per addition and subtraction subtask.* (*Untimed subtask*).
Word Problems	This subtask requires the ability to interpret a situation (presented orally to the pupil), make a plan, and solve the problem.	…solve problems presented orally using any strategy that they wanted, including the use of paper and pencil and/or counters supplied by the assessor. *Because the focus of this subtask was on assessing the pupils' ability to interpret a situation, make a plan, and solve a problem, the numerical values involved in the problem were deliberately small to allow for the targeted skills to be assessed without confounding problems with calculation skills that might otherwise impede performance. The problem situations used were designed to evoke different mathematical situations and operations. There were six items.* (*Untimed subtask*)

* The Addition and Subtraction Level 2 subtasks are more conceptual than the Addition and Subtraction Level 1 subtasks because the pupils must understand what they are doing, applying the Level 1 skills. Level 2 subtasks are not purely conceptual, however, because, with time, pupils—especially in Grade 3—will develop some automaticity with the items in these subtasks.

The Snapshot of School Management Effectiveness for the DRC

In addition to administering the EGRA and EGMA instruments to pupils, a series of school management effectiveness instruments were used to provide a multifaceted picture of the school management and pedagogical practices in place in the sampled schools. The Snapshot of School Management Effectiveness (SSME) collects a variety of information, including information about pupil and household characteristics, basic school inputs (e.g., school infrastructure, pedagogical materials, teacher and head teacher characteristics), and classroom teaching and learning processes (e.g., instructional content, pupil–teacher interaction, and assessment techniques). The seven SSME components are as follows:

- Pupil Questionnaire: Administered to each pupil randomly selected for assessment
- Head Teacher Questionnaire: Administered to the head teacher in each school visited
- Teacher Questionnaire: Administered to the teachers whose pupils are selected for assessment
- School Inventory: Administered at each school visited
- Classroom Inventory: Administered in each of the sampled classes

- Classroom Observation (National Languages): Administered during reading and writing lessons in Grade 3 classrooms
- Classroom Observation (Mathematics): Administered during mathematics lessons in Grade 3 classrooms,

Assessor Recruitment

A rigorous and effective recruitment process was used to identify qualified candidates for assessor training. Candidates were recruited openly, with applications short-listed by CENADEP staff. All short-listed candidates were required to perform the following:

- Complete a written test that consisted of passage reading and comprehension, grammar, and basic computing items (i.e., parts of a computer, how to write a text message on a telephone).
- Read aloud the same passage of the written test, followed by a few questions regarding the text read to verify understanding
- Participate in an oral interview that included general knowledge questions about data collection and techniques that can be used to put a child at ease.

Sample

This sample for the 2015 baseline EGRA and EGMA was selected using a three-stage sample of schools, classrooms, and pupils. A total of 240 schools were selected with equal probability within each of the individual "Province" and "Year of Expected Entry" cohorts. After prospective sample schools were verified, the assessment team traveled to the sample schools and randomly selected one Grade 3 classroom and one Grade 5 classroom. In each selected classroom, 10 pupils were randomly selected. Schools in which sufficient numbers of Grade 3 and Grade 5 pupils were not in attendance on the day of assessment were replaced by comparable replacement schools. This sample methodology provided an estimated 2,400 Grade 3 pupils and 2,400 Grade 5 pupils. Of these pupils, complete data were obtained for 2,347 Grade 3 pupils and 2,326 Grade 5 pupils.

Grade 3 and Grade 5 Comparison of EGRA Results

A comparison of Grade 3 and Grade 5 percent zero scores and mean scores across EGRA subtasks is provided in ***Annex 1***. However, this is not a straight comparison because Grade 3 pupils were tested in mother tongue according to the province in which they lived, whereas Grade 5 pupils were tested in French. This comparison provides an overall summary, however, of overall pupil proficiency levels.

- Mother Tongue Oral Vocabulary: Grade 3 pupils performed well on the three Oral Vocabulary subtasks in their respective mother tongue languages. Only in Katanga did 11% of pupils score zero on the second vocabulary subtask. In all other provinces and on all other vocabulary measures, only up to 2% of pupils scored zero, and, overall, Grade 3 pupils were able to correctly respond to 74% of vocabulary items (averaging across vocabulary subtasks and provinces).
- French Oral Vocabulary: This subtask was more of a challenge for Grade 3 pupils, with an aggregate percentage of zero scores of 16% (averaging across vocabulary subtasks and provinces). For Grade 5 pupils, this aggregate percentage of zero scores is only 8%. In both grades, the pupils tended to struggle more with the second vocabulary subtask, which required them to move a pencil in front of, behind, under, on top of, or next to another object.

- Letter Sound Identification: Nearly one-fourth of Grade 3 pupils across provinces scored zero on this subtask, indicating that they were unable to correctly identify even one letter sound correctly in their mother tongue languages. Out of 100 possible letter sounds, the overall average of correctly identified letter sounds was 11 for Grade 3 pupils. In French, Grade 5 pupils had fewer zero scores (6%) and were able to correctly identify an average of 27 letter sounds correctly.
- Familiar Word Identification: The Grade 3 pupils demonstrated even lower performance on the Familiar Word Identification subtask, with an average of 79% zero scores and only 3 words correctly identified per minute in their mother tongue languages. In comparison, only 39% of Grade 5 pupils scored zero on this subtask, and Grade 5 pupils identified an average of 12 correct words per minute (cwpm) in French.
- Invented Word Identification: Performance on the Invented Word Identification subtask, which measures a pupil's ability to sound out, or decode, new words, was also low, with 87% of Grade 3 pupils scoring zero and an average of 1.5 cwpm identified by Grade 3 pupils in their mother tongue languages. In French, 42% of Grade 5 pupils scored zero, and Grade 5 pupils were able to identify only 9 cwpm.
- Oral Reading Fluency: In general, poor performance on word identification subtasks corresponds with poor performance on the Oral Reading Fluency (ORF) subtask because both subtasks require fluent word reading abilities. On average, 82% of Grade 3 pupils scored zero on this subtask, with those pupils who could read at least one word, reading an average of only 2 cwpm in their mother tongue languages. The percentage of zero scores was lower for Grade 5 pupils at 34%, with pupils on average reading 18 cwpm.
- Reading Comprehension: Reading comprehension scores are dependent upon ORF scores because pupils are only given comprehension questions that correspond with the text that they have read. ORF passages are generally developed so the pupils must read between 8 and 10 cwpm in order to be asked the first comprehension question. Because, on average, Grade 3 pupils read only 2 cwpm, they would have been able to answer very few comprehension questions. Indeed, the average Grade 3 score on the Reading Comprehension subtask was 0.1. The Grade 5 pupils scored higher on the ORF subtask and, thus, would have been given more comprehension questions to answer. The French Oral Vocabulary passage prompted the first reading comprehension question after the seventh word in the passage and the second reading comprehension question after the 21st word in the passage. Because Grade 5 pupils read, on average, 18 cwpm, many pupils would have been given the opportunity to respond to only the first comprehension question. If all pupils had correctly answered the comprehension question(s) received, then the average Grade 5 score on the Reading Comprehension subtask should have been between one and two questions. The actual average score was 0.7 question, suggesting that not all pupils were able to respond correctly to those comprehension questions they received.

Interestingly, as shown in ***Annex 1***, Level 3 pupils in the Kivu ALPs tended to score higher than Grade 5 pupils; therefore, their performance trends may be of interest within the ACCELERE! project. In the other provinces, however, Grade 3 pupil performance shows a lack of proficiency in even pre-reading oral vocabulary and letter identification skills in pupils' mother tongue languages, and this will, in turn, hinder reading at grade level. This lack of proficiency is also the case in Grade 5,

with pupils not reaching the levels of fluency with oral language, letter knowledge, and discrete word reading that are needed to support fluent connected text reading with comprehension. The ACCELERE! project will need to focus efforts at remediating these early grade reading skills as quickly as possible, so that higher level reading fluency and comprehension goals can be met.

Linkages Between Surveys

It is worthwhile exploring the linkages between pupil learning, as measured by the EGRA, and the school context. Specifically, it is worthwhile to learn whether any aspects of the school context, such as teacher characteristics (e.g., training) or teaching and learning processes, show a statistically significant linkage with pupil outcomes. If so, and if variation in some aspects of the teaching and learning context predicts variation in pupil reading and mathematics outcomes, then these aspects might be areas in which school leaders and Ministry officials can focus their attention.

To this end, a series of regression analyses were conducted. The findings from the analyses showed that many of the variables that are often believed to be associated with enhanced classroom instruction and pupil learning were, in fact, not linked. The majority of teacher and head teacher characteristics, such as content-specific training, degrees, and experience, were not found to predict variation in pupil outcomes. However, the models showed that several other variables, including teachers' classroom management techniques (specifically responding to situations in constructive ways), head teachers' use of learned management techniques, time spent reading, and fewer incidences of school violence, were all strongly associated with the likelihood of pupils reading at a higher level. These findings could inform a renewed focus on those aspects of the school environment that are shown to be associated with learning outcomes, as opposed to those that routinely are not (e.g., teacher and head teacher characteristics).

2 Challenges and Recommendations

Every evaluation project presents both challenges and opportunities. This study was particularly interesting in that it served as the baseline measure for a USAID implementation study that had not yet fully started by the time this study's districts and schools had to be sampled.

This section introduces and discusses challenges that arose due to timing and other factors; it also describes the lessons that were learned and recommendations that USAID may consider for moving forward in the DRC.

2.1 Instrument Adaptation

One of the first steps in administering EGRA or EGMA in a given country is to adapt each of the assessment's subtasks to the local context and language(s). In the case of this study, EGRA subtasks were adapted to reflect the languages being assessed, develop oral language illustrations that are appropriate for the context, develop letter grids that reflect the frequency with which letters appear in the target languages, develop non-words based on letter frequencies and language patterns, select familiar words based on the local curriculum, and develop ORF passages based on identified familiar words appropriate for the language, context, and age of students. EGMA subtasks that are simple computational problems, such as additional and subtraction problems that are not embedded in word problems, were reviewed to ensure that they were the proper level of difficulty for the target grades. Word problems were also revised to ensure cultural and language appropriateness. For example, a word problem referencing apples could be changed to reference a fruit that is native in the DRC or, more generally, to the reference "fruit."

A five-day adaptation workshop was held in Kinshasa in November 2014 that included participants from the Ministry of Primary and Secondary Education and Initiation to New Citizenship (MEPS-INC, Le Ministère de l'Enseignement Primaire, Secondaire et Initiation à la Nouvelle Citoyenneté) headquarters in Kinshasa; these participants were selected for their expertise in early grade literacy and mathematics pedagogy, school management, and assessment. Four experts from RTI International led the reading, writing, and mathematics portions of the adaptation workshop.

EGRA adaptation went well, although a substantial amount of time was spent to determine how to best represent items for the Oral Vocabulary subtask. For example, a monkey was removed as a familiar animal, and guidance regarding how to modify illustrations for animals and items (e.g., frog, duck, banana) were given.

EGMA adaptation included substantial discussion regarding how to determine whether a pupil understood what he or she was being asked in order to most effectively measure that pupil's knowledge. As with EGRA adaptation, the SSME adaptation included a lot of discussion regarding how to refine questions within each language, how to address pupils' safety, and how to properly depict specific items in the pupil questionnaire, such as sources of water, types of cooking tools or appliances, types of toilettes, and various household goods and modes of transportation.

Recommendation: Although instrument adaptation went well for all three sets of instruments, a lot of time was spent identifying how to illustrate images. Although ultimately all subtasks were effectively adapted, the focus on illustrations impacted the adaptation schedule. It is recommended that, as much as possible, existing illustrations be used to avoid this situation. It is also critical that a combination of MEPS-INC staff, language and linguistics experts, and teachers be involved in any future adaptation process, if one is needed, so that the resulting instruments are contextually relevant, linguistically appropriate, and grade specific.

2.2 Language of Instruction

In a study such as this, it is particularly relevant to look at how the language that pupils speak at home corresponds with the language in which they were assessed—which should be the language in which they are taught how to read and do mathematics. Many education experts agree that, assuming the presence of quality instruction, pupils learn to read more efficiently when they learn to read first in a familiar language.[3,4] Conversely, when the language used to teach reading is not the pupil's home language or a language that she or he understands well, learning to read becomes more difficult. Because of this, knowing which languages are spoken at home provides insights into why pupils may or may not perform well on EGRAs and EGMAs.

For this study, the language in which Grade 3 pupils were assessed varied by province, as shown in ***Table 3***.

[3] Nation, I. S. P. (2006). How large a vocabulary is needed for reading and listening? *Canadian Modern Language Review, 63*(1), 59–82.
[4] Nation, P., and Wang, K. (1999). Graded readers and vocabulary. *Reading in a Foreign Language*, *12*(2), 355–380.

Table 3. Assessments administered by province

Location	Grade 3		
	EGRA	SSME	EGMA
Equateur	Lingala French (Oral Vocabulary)	✓	
Kasai Occidental	Tshiluba French (Oral Vocabulary)	✓	
Kasai Oriental	Tshiluba French (Oral Vocabulary)	✓	
Katanga	Kiswahili French (Oral Vocabulary)	✓	✓

Challenge: During instrument adaptation, it became apparent that different dialects of Kiswahili are spoken in different provinces and even between urban zones (such as Lubumbashi) and rural parts of Katanga. For example, in Tshiluba, the letter "w" is not used in words; instead, the "u" is used in place of the "w." Also, the pronunciation of words in Tshiluba can vary between Kasai Oriental and Kasai Occidental. Because the same EGRA instrument was used across provinces, the adaptation workshop participants discussed how to select words and phrase instructions so that they were appropriate across the provinces in which a given language was to be used. During assessor training, however, the assessors from Katanga raised concerns about their fluency in the official Kiswahili. Many of them said they were more comfortable administering the assessment in their local dialects. The assessors also suggested that pupils might not be able to understand instructions or respond to stimuli in the official language.

Recommendation: Because the issue of assessor discomfort with languages of assessment was raised and, seemingly addressed, during the adaptation workshop, having assessors raise this issue again during assessor training was unexpected. Upon further debate, the decision to test pupils in Katanga in official Kiswahili was re-confirmed, and RTI worked with assessors to practice their Kiswahili to gain fluency with the assessments. Assessors also annotated their EGRA protocols as needed for additional support. Assessment teams were also selected so that at least one assessor per team was fluent in official Kiswahili. It is recommended that during midline and endline assessor training attention be given to assessors' levels of fluency in Kiswahili as they are recruited and trained.

2.3 Sample

Challenge: The initial population of interest for the baseline EGRA/EGMA consisted of Grade 2 and 4 pupils who were attending public schools located in the specific education sub-provinces specified in the USAID Request for Task Order Proposals (RFTOP) in May of 2015. However, given that this study's data were to be used as the baseline measure for the ACCELERE! project in the DRC for which intervention zones had not been decided when RTI needed to draw a sample, RTI and USAID agreed to postpone the data collection until intervention zones were decided. This delay meant that RTI was unable to collect data at the end of the 2015 school year. RTI, therefore, proposed to assess those children at the beginning of the following school year as they moved into Grades 3 and 5. While this was not ideal technically, the assessment would have otherwise been of no use to the ACCELERE! project as a baseline.

In addition, to select a sample, a total population of schools was needed. Census lists were obtained from provincial ministry representatives. However, these census

lists were often incomplete, making it necessary for the RTI project team to go through all lists to determine accuracy. After the lists were cleaned and processed, the total population was estimated to include approximately 3,683 schools (see ***Table***).

Table 4. Population of interest for the 2015 DRC baseline EGRA/EGMA

Province	Year of Expected Entry	Education Sub-provinces*	Total Schools in Sub-province†
Equateur	Year 2	Businga, Gemena 1 (Gemena), Gemena 2 (Bwamanda)	509
	Year 3	Bikoro, Ingende, Mbandaka 1, Mbandaka 2	557
Kasai Occidental	Year 2	Kamuesha/Tshikapa Est, Kananga 1, Kitangua/ Tshikapa Ouest, Tshikapa Centre	672
	Year 3	Kananga 2 Kazumba Centre Kazumba Nord Kazumba Sud	581
Kasai Oriental	Year 2	Kabinda I, Kamiji	46
	Year 3	Mbuji-Mayi 1, Mbuji-Mayi 2, Mbuji-Mayi 3, Miabi	212
Katanga	Year 1	Kamina I, Kipushi, Likasi, Lubumbashi II, Sakania	450
	Year 3	Kalemie, Kasaji, Kolwezi I, Kolwezi II, Mutshatsha	483

* Education sub-provinces as indicated by Chemonics to USAID as of September 9, 2015, just before baseline data collection.
† Estimated.

Following the section of the sample of schools to assess and during actual fieldwork, it became apparent that some rural schools were too difficult to travel to. Therefore, replacement schools that were determined to be similar demographically were selected for assessment.

Recommendations: Ideally, the implementation districts and schools would be identified before sampling for baseline assessment must occur. In this study, there was a delay in identifying implementation districts, which caused delays in sampling for the baseline and ultimately resulted in schools being sampled for the baseline assessment that may not end up receiving the ACCELERE! intervention. As the ACCELERE! project evaluates the baseline data and prepares for midline data collection, we recommend that they align, as much as possible, their current implementation schools with the schools tested at baseline in order to have the greatest chances of showing change in pupil performance over time.

Having had the implementation districts and schools identified in advance would have also allowed baseline fieldwork to occur in mid-2015 as intended, rather than at the beginning of the following school year. ACCELERE! will have to determine whether it will continue testing—for midline and endline assessments—students at the beginning of the school year or move to an end-of-school-year testing cycle.

Finally, it is important to have complete and correct census data when drawing samples for assessments. If ACCELERE! needs to select additional schools to test at midline and endline, its team should allow sufficient time to obtain existing census data and fill in any missing data as needed.

2.4 Assessor Training

Assessor training in Mbandaka.

Five international project staff spent two weeks in Lubumbashi in September 2015 training a group of 50 assessors and supervisors as well as two master trainers from the National Center for Development Support and Popular Participation (*CENADEP, Centre National d'Appui au Développement et à la Participation Populaire*). Of the 50 trained assessors, 44 were selected to conduct data collection based on observed performance during school practice and inter-rater reliability results. Subcontractor CENADEP's master trainers then traveled to three venues in Mbuji-Mayi, Kananga, and Mbandaka to train a total of 97 assessors and supervisors, 84 of whom were retained to conduct data collection in Equateur, Kasai Occidentale, and Kasai Orientale. Assessors received training on how to administer each subtask of the EGRA and EGMA, how to interact with pupils (and school staff) during the assessment, and how to properly implement the protocol for visiting the sampled schools and randomly selecting the pupils to be assessed. Assessors learned how to operate handheld electronic tablet devices loaded with the Tangerine® software.

Tangerine is electronic data collection software designed for use on mobile computers, including netbooks, tablet computers, and smartphones. The primary use of Tangerine is to enable recording of students' responses in oral early grade reading and mathematics skills assessments, specifically EGRA and EGMA, and interview responses from students, teachers, and principals regarding home and school context information (these data are collected through a battery of surveys called the SSME).[5] Once assessors are trained on how to properly use of the Tangerine system, no additional user's guides or manuals are needed.

This software, designed for education survey data collection, allowed assessors to gather all the data on the tablets rather than on paper, thus streamlining the data collection and data cleaning process. Data are then uploaded from tablets to a cloud-based database, where project staff can review, clean, and analyze data. Assessors were trained in how to administer the tests as well as how to save and upload the finished assessments. In all, 128 assessors were trained and retained to conduct data collection in the 252 schools.

Challenge: Unfortunately, during the assessor training, difficulties with the wireless Internet devices (TP Links) provided for training were encountered, making it difficult for assessors to upload their practice assessments for inter-rater reliability ratings to be calculated. This problem was due to the local network not consistently supporting the G3-based devices. The issue was resolved by utilizing assessor and presenter phones that had wireless Internet sharing ability. To address this issue during actual fieldwork, 32 phones were purchased for the teams to use in place of the original TP Links.

Recommendation: Prior to midline and endline assessor training (or refresher training, as needed), the network availability in every training site and in the field

[5] For more information about Tangerine, see http://www.tangerinecentral.org/project-1

should be explored. Backup options for providing Internet access to assessors should be considered and acquired in advance.

Challenge: During training, it became apparent that the assessors were not equally familiar with the language that they were to use to assess the pupils.

Recommendation: To address this issue, during assessor training, a majority of one day was spent so assessors could practice reading the instrument protocols and practice word pronunciation. The fluency with which assessors were able to read and understand the language of the instrument was a factor in making final assessor selection and assignments. For future data collections, care should be taken to identify and resolve assessor language issues as early in the process as possible.

2.5 Survey Administration

In general, the administration of the EGRA and EGMA instruments went well. However, some technical challenges occurred when uploading data from the tablets. Plus, some Grade 3 pupils and assessors became fatigued during the assessment (for more details, see Subsection 2.6).

Challenge: A technologically related issue arose when some assessment teams experienced difficulties sending data from schools because of insufficient Internet coverage.

Recommendation: Planning for similar connectivity challenges in future data collection efforts should ensure that proper back-up options are in place and incorporated into the assessor training.

In addition to administering the EGRA and EGMA instruments, the assessors observed classrooms to evaluate teacher and pupil behaviors. These classroom observations required that the assessors make note of which of a variety of activities occurred at 3-minute intervals over the course of a class period.

Challenge: To facilitate this classroom observation timing, a timer is provided within the Tangerine® system. Unfortunately, during the administration of the classroom reading observation on the tablets, the timer was not visible until after the alarm sounded at the end of the third minute.

Recommendation: To resolve this obstacle, the assessors were asked to follow the timer displayed at the bottom of the video on the tablet and to take a snapshot of the video after 1 minute of observation elapsed to document the time. Should this obstacle occur in the future, this solution can be followed again. In addition, the assessors could be provided with and trained on how to properly use separate stopwatches.

2.6 Data Collection

Data collection occurred from October to December 2015. The pupils were given EGRA and EGMA stimulus sheets and assessors scored the pupils' responses on the tablet. The assessors conducted Classroom Observations; completed Pupil, Teacher, and Head Teacher Questionnaires; and completed School and Classroom Inventories. At the end of each school visit, the assessors used a wireless router and modem to upload the collected data to a central server. The assessment teams planned to complete each school's data collection in one day. Given the number of assessments, it was challenging to maintain this schedule, although all of the assessments were completed.

Once the assessors had access to the Internet, they uploaded the collected data from their tablets to the Tangerine data storage Web site. The data were downloaded

daily from RTI's offices in Research Triangle Park, NC, and Washington, DC. The data were cleaned and monitored to be sure the assessment team was visiting the correct school and that they were collecting the expected number of observations for each school. The data were run through a series of data quality control checks. When data indicated that specific assessors were making repeated data collection errors or large errors, the field managers were notified immediately, and they, in turn, notified the supervisors so that the errors would be corrected immediately. During data collection, some major errors occurred (e.g., some assessors forgot to complete the School Inventory Questionnaire). Some small errors repeatedly occurred (e.g., some assessors incorrectly used the timer during timed subtasks). No other issues arose with data cleaning or data analysis.

Once the data sets were checked and edited as needed, the data sets were merged, and final data processing procedures were conducted. These procedures included deriving additional variables, calculating the sample weights and finite population corrections, and indicating the complex sample strategy for the data analysis. Following these procedures helped to guarantee that the complex sampled data would be representative of the population that it was meant to represent and that the precision estimates (i.e., standard errors) would be appropriately calculated by taking the cluster effect into account.

Timing of Testing

Challenge: Assessors were trained in September 2015, but because the target zones had not yet been identified by the ACCELERE! Project and verified by the assessment team, data collection was delayed, beginning in October 2015 and lasting through December 2015. In some cases, the assessors waited more than one month before being deployed to the field to begin data collection. As a result, the information acquired from the training was less fresh, and some information was not retained, although RTI did conduct a short refresher training session to assessors.

Recommendation: RTI recommends that the amount of time between the assessor training and the data collection be reduced to no more than two weeks to ensure maximum information retention and to avoid some possible availability concerns resulting from down time.

Accessing Schools

Challenge: Data collection required teams of assessors to travel to schools that were not necessarily aware of the nature of their involvement in the study. To mediate concerns among school staff, each assessment team carried a letter of authorization from the MEPS-INC introducing the study and the assessment team. For most communities and school staff, this letter of authorization was sufficient to allow access to the school and pupils for testing. However, at one school in Kasai Occidental, even with the letter, the assessment team was rejected by the school. The USAID Contracting Officer Representative intervened with the General Secretary of the MEPS-INC and entrance to the school was then allowed.

Recommendation: Having a letter of authorization from the appropriate person in the MEPS-INC is helpful in gaining entrance to schools. As much as possible, confirming in advance with school staff that assessment teams will be allowed into the school would also be helpful, although it is important to not let school staff know exactly when assessors will be on campus.

Challenge: Some of the schools visited were located in high security–risk areas. For example, in one community, the assessment team was threatened by villagers wielding machetes and left the area without testing. Therefore, assessment teams had to quickly select replacement schools in response to these security concerns.

Recommendation: RTI recommends establishing contact with community leaders and/or the local police force before a data collection visit occurs because this will help to mitigate potential security concerns for visiting assessors. In areas where there is the possibility of risk to assessors, the assessment teams can be escorted by local authorities, although this increases the logistics to be managed. Providing badges, hats, or jackets to assessors to identify them as representing the project can also help to reassure school staff and community members. However, it is important to note that non-governmental organization staff can be targeted in violent attacks; therefore, having those types of visible identification could actually put assessors at risk.

Challenge: In addition, a few assessors became ill during data collection, including one assessor who became ill with cholera.

Recommendation: RTI recommends that each assessment team keep in regular contact with the in-country team leader so that preventive measures can be taken in cases of sickness or security threats. A daily short messaging service (SMS [i.e., text message]) system was implemented, which worked well to inform the CENADEP team leader in Kinshasa of daily progress of data collection, as well as any potential risk areas. In this particular case, the team leader was able to identify the closest hospital and advised the assessment team to take their colleague there for treatment. The assessor was treated and released fully recovered some days later.

Challenge: Specifically related to ALP schools, challenges also arose in accessing schools. Some centers in South Kivu are accessible only by traveling through North Kivu. Also, the assessment teams found fictitious centers that were not open, and they expressed security concerns when traveling through these areas.

Recommendation: When preparing for future data collection, it is advisable to confirm the presence and locations of schools in advance and to contact and coordinate with political and administrative authorities throughout data collection in order to protect assessment teams.

Student and Assessor Fatigue

Challenge: Because of the number of EGRAs and EGMAs for Grade 3 pupils in Katanga, one day of data collection per school to assess 10 students was a challenging time standard to meet. Especially in Katanga province, the pupils appeared to become fatigued, and a sense of assessor burnout surfaced.

Recommendation: In response, RTI provided an incentive bonus to assessors to encourage the completion of all school visits. Similar bonuses for future assessments should be considered, especially if the length of the assessment remains the same. Also, based on this experience, if collecting data for both EGRA and EGMA simultaneously, RTI would recommend a second day per school for midline and endline data collection.

An assessor practices EGRA administration in Katanga.

Overall, RTI benefited greatly from its collaboration with the subcontractor, CENADEP. Before this baseline study, CENADEP had managed the logistics of two other EGRA, EGMA, and SSME studies in the DRC; therefore, CENADEP has a great depth of experience. The two team leaders, in particular were named as key personnel, given their demonstrated strengths as trainers and their extensive knowledge of the instruments. After this study, RTI engaged CENADEP's Mr. Thierry Nzewo to lead the assessor training for an EGRA in Mali, further demonstrating his value as a partner in this type of work.

Working with a subcontractor was particularly necessary for this study, because RTI did not have a team in the DRC. Even within the ACCELERE! project, however, given the logistics load, working with a subcontractor to manage assessor recruitment, assessor training, and data collection is recommended.

3 Conclusions and Lessons Learned

The DRC is a geographically and logistically challenging environment in which to conduct a study such as this one. Instability in provinces in the northeast make it challenging for assessors to conduct fieldwork. In addition, difficulty in accessing more rural schools further complicates data collection. This particular study faced additional challenges because the timelines did not fully accommodate the timing of the ACCELERE! project, school census data were not accurate, and technology failed at times. That said, through this study, reliable baseline data were collected and important lessons were learned.

Overall, this study shows that pre-reading and reading skills in mother tongue languages for Grade 3 pupils and in French for Grade 5 pupils are not at the levels needed for pupils to read with comprehension at grade level. Even at Grade 5, the pupils were reading connected text at only between 10.9 and 17.7 average cwpm, with the exception of Level 3 ALP pupils, who read on average 30.1 cwpm. This rate reflects a reading speed of one word every 3 to 6 seconds (or every 2 seconds in the ALPs), which is too slow to allow for real comprehension. The ACCELERE! project will need to take these current levels into consideration when leveling instruction for pupils in the early and mid-primary grades.

As preparations are made for midline and endline data collection, the ACCELERE! project might take the following lessons learned into consideration:

- **Language of Assessment.** Because of differences in dialects spoken in different provinces, unplanned time needed to be spent with assessors trained for this baseline assessment to build fluency in the languages being assessed. Although RTI staff performed their due diligence by vetting assessors and were able to provide the necessary training and support to these assessors, when planning for future data collections, care should be taken to address any possible assessor language issues earlier in the process.
- **Sample Selection.** In this study, there was a delay in identifying implementation districts, which subsequently caused delays in sampling for the baseline and ultimately resulted in schools being sampled for the baseline assessment that may not end up receiving the ACCELERE! project intervention. Because the ACCELERE! project evaluates the baseline data and prepares for midline data collection, we recommend that the ACCELERE! project align, as much as possible, its current implementation schools with the schools tested at baseline in order to have the greatest chances of showing change in pupil performance over time. Staff supporting the ACCELERE! project will need to determine whether to continue testing (for midline and endline assessments) the students at the beginning of the school year or to move to an end-of-the-school-year testing cycle. Finally, it is important to have complete and correct census data when drawing samples for assessments. If staff supporting the ACCELERE! project need to select additional schools to test at midline and endline, then they should allow sufficient time to obtain existing census data and fill in any missing data as needed.
- **Survey Administration.** Technical issues arose during the assessor training with the wireless Internet devices (TP Links). This problem was because the local network does not consistently support G3-based devices. Before midline and endline assessor training (or refresher training, as needed), the network availability in every training site and in the field should be explored, and backup options for providing Internet access to assessors should be considered and acquired in advance.
- **Data Collection.** A number of challenges were identified and addressed during data collection. Because of the delay in identifying target zones by the ACCELERE! project, more time elapsed than was desired between assessor training and actual fieldwork, which required RTI staff and assessment team supervisors to monitor the assessors closely to ensure that no knowledge had been lost. Also, specific schools were found to be either inaccessible or unsafe, and replacement schools were identified and tested. For future data collections, each assessment team should be provided with letters of authorization and work with local authorities to secure their safety while traveling to schools to collect data. Finally, because of the length of the assessments—particularly in the district in Katanga where both the EGRA and the EGMA were administered to Grade 3 pupils—both the assessors and pupils became fatigued. The ACCELERE! project may reconsider the length of the assessments or identify ways to spread testing over a longer period of time in order to combat this issue.

Overall, RTI benefited greatly from its collaboration with CENADEP, the subcontractor. Working with a subcontractor was particularly necessary for this study because RTI did not have a team in the DRC. Even within the ACCELERE! project,

however, given the logistics load, working with a subcontractor to manage assessor recruitment, assessor training, and data collection is recommended.

Following the completion of data analysis, national and regional findings workshops were held to share the results of this study and to identify recommendations for improving progress in reading and mathematics in the lower primary grades. A list of recommendations generated in these workshops is provided in ***Annex 2***. It is hoped that the lessons learned identified in this report and the recommendations from these workshops will assist USAID and the ACCELERE! project as they promote increased pupil learning in the DRC.

Annex 1. Grade 3 and Grade 5 Summary Scores

EGRA Subtask and Language of Assessment	Province	Summary Scores			
		Grade 3		Grade 5	
		Percent Zero Scores	Mean Score	Percent Zero Scores	Mean Score
Oral Vocabulary 1 *Grade 3: MT*	Equateur	0%	6.1	—	—
	Kasai Occidental	1%	7.2	—	—
	Kasai Oriental	0%	7.8	—	—
	Katanga	1%	5.9	—	—
Oral Vocabulary 2 *Grade 3: MT*	Equateur	1%	4.8	—	—
	Kasai Occidental	2%	4.5	—	—
	Kasai Oriental	0%	4.9	—	—
	Katanga	11%	2.6	—	—
Oral Vocabulary 3 *Grade 3: MT*	Equateur	2%	4.8	—	—
	Kasai Occidental	1%	6.7	—	—
	Kasai Oriental	0%	6.8	—	—
	Katanga	1%	3.7	—	—
Oral Vocabulary 1 *Grade 3: French* *Grade 5: French*	Equateur	9%	3.2	2%	4.8
	Kasai Occidental	21%	3.1	1%	4.8
	Kasai Oriental	0%	5.0	2%	5.6
	Katanga	3%	4.0	0%	5.5
	Kivu ALPs	—	—	2%	5.6
Oral Vocabulary 2 *Grade 3: French* *Grade 5: French*	Equateur	22%	2.1	15%	2.5
	Kasai Occidental	51%	1.2	14%	2.6
	Kasai Oriental	23%	2.1	42%	2.0
	Katanga	18%	2.5	15%	3.5
	Kivu ALPs	—	—	16%	3.7
Oral Vocabulary 3 *Grade 3: French* *Grade 5: French*	Equateur	17%	2.3	4%	4.1
	Kasai Occidental	26%	2.4	3%	4.2
	Kasai Oriental	3%	3.2	2%	5.3
	Katanga	3%	3.8	0%	5.4
	Kivu ALPs	—	—	1%	5.8
Letter Sound ID *Grade 3: MT* *Grade 5: French*	Equateur	27%	9.0	7%	20.9
	Kasai Occidental	30%	12.9	10%	24.4
	Kasai Oriental	17%	11.7	8%	28.0
	Katanga	18%	10.0	3%	26.2
	Kivu ALPs	—	—	2%	33.4
Familiar Word ID *Grade 3: MT* *Grade 5: French*	Equateur	91%	1.1	54%	6.6
	Kasai Occidental	72%	3.9	48%	9.6
	Kasai Oriental	72%	3.2	41%	10.9
	Katanga	82%	2.1	40%	11.1
	Kivu ALPs	—	—	14%	21.2
Invented Word ID *Grade 3: MT*	Equateur	91%	0.7	59%	5.2
	Kasai Occidental	82%	2.2	46%	7.6

EGRA Subtask and Language of Assessment	Province	Summary Scores			
		Grade 3		Grade 5	
		Percent Zero Scores	Mean Score	Percent Zero Scores	Mean Score
Grade 5: French	Kasai Oriental	86%	1.7	48%	8.1
	Katanga	88%	1.4	41%	8.0
	Kivu ALPs	—	—	14%	14.7
Oral Reading Fluency *Grade 3: MT* *Grade 5: French*	Equateur	82%	1.7	45%	10.9
	Kasai Occidental	80%	2.6	43%	15.8
	Kasai Oriental	80%	2.2	36%	17.2
	Katanga	84%	1.3	34%	17.7
	Kivu ALPs	—	—	10%	30.1
Reading Comprehension *Grade 3: MT* *Grade 5: French*	Equateur	92%	0.1	81%	0.3
	Kasai Occidental	90%	0.2	65%	0.6
	Kasai Oriental	92%	0.1	69%	0.5
	Katanga	96%	0.1	69%	0.7
	Kivu ALPs	—	—	39%	1.5

Note: MT = Mother tongue language was selected for that region.

Annex 2. Results of Findings Workshops

After the data analysis for this study was completed, a national level findings workshop was held in Kinshasa on May 3–4, 2016. Participants in this workshop included staff from the ACCEs-Lectures-Retention and Accountability (ACCELERE!, ACCEs-LEcture-Retention et redevabilité) project in the Democratic Republic of the Congo and the Empowering Adolescent Girls to Lead Through Education (EAGLE) project. Workshop participants also included representatives from the U.S. Agency for International Development (USAID) and the Ministry of Primary and Secondary Education and Initiation to New Citizenship (MEPS-INC, MEPS-INC, Le Ministère de l'Enseignement Primaire, Secondaire et Initiation à la Nouvelle Citoyenneté).

Subsequent regional findings workshops were held in May and June 2016 in Bukavu, Gome, Kananga, Lubumbashi, Mbandaka, and Mbuji Mayi. Participants in the regional findings workshops included representatives from the provincial-level MEPS-INC, public school coordinators, the head of provincial educational division, and staff from civil society organizations.

The final activity of each of the workshops was structured so the participants could make recommendations for future progress in reading and arithmetic for children in the lower primary grades. Participants were organized into groups where they discussed issues emerging from the findings and generated the following recommendations:

- **Language of Instruction:** Conduct further investigation regarding the language spoken in a pupil's home as compared with the language of instruction to inform strategies that can be taken to minimize the impacts on performance outcomes when the language spoken at home is not the same as the language of instruction.
- **Teacher Training, Support, and Development:** Recommendations to improve the quality of instruction included the following:
  - Prepare teacher training sessions that apply positive classroom discipline practices
  - Focus efforts on in-service teacher trainings, irrespective of teacher qualifications and experience
  - Closely monitor teachers' practices and routinely provide feedback to them (by principals and/or head teachers, inspectors, and committees of parents)
  - Provide refresher teacher training
  - Organize exchanges between teachers from different provinces to share best practices
  - Establish an ongoing program of interscholastic competition with prizes to encourage teachers to improve the quality of their performance
  - Restore teaching units and central-level oversight, formerly conducted by the National Training Service of the General Inspectorate of Primary and Secondary Education (*Service National de Formation [SERNAFOR] de l'Inspection générale de l'Enseignement Primaire et Secondaire*).[6]

[6] SERNAFOR is the central oversight agency for primary and secondary teachers. For more information about SERNAFOR, see http://fr.allafrica.com/stories/200907290932.html

- **Family Support:** Recommendations to increase family support included the following:
  - Encourage parental involvement in providing assistance with or reviewing homework
  - Train members of parent committees to conduct school monitoring visits
  - Ensure that every pupil has additional reading materials at home.
- **School Environments:** Recommendations to promote better learning outcomes in schools included the following:
  - Reduce class sizes to a manageable number of pupils per class per national policy
  - Implement free primary education in all schools
  - Create and build more public schools
  - Equip teachers with sufficient teaching materials, posters, and training manuals
  - Provide better salaries for teachers
  - Ensure that every pupil has reading textbooks in class.