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MobiLiteracy-Uganda Program

Phase 1: Endline Report

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Acronyms

AusAID	Australian Agency for International Development
clspm	correct letter sounds per minute
cnwpm/cnonwpm	correct nonwords per minute
CSR	Center for Social Research
EGRA	early grade reading assessment
EMIS	education management information system
IRB	institutional review board
IRR	inter-rater reliability
IVR	interactive voice response
MLIT	MobiLiteracy
P1	Primary 1 (Grade 1)
P2	Primary 2 (Grade 2)
RCT	randomized controlled trial
RTI	Research Triangle Institute International
SES	socioeconomic status
SHRP	School Health and Reading Program Uganda
UP	Urban Planet Media and Entertainment Corporation/Urban Planet (UP)
USAID	United States Agency for International Development

Executive Summary

Background

In 2012, Urban Planet Media and Entertainment Corporation/Urban Planet (UP[1]) was awarded a grant through All Children Reading: A Grand Challenge for Development. The grant awarded to UP is being used to develop, pilot test, and evaluate an early literacy product in Uganda that targets parents through their mobile phones and encourages them to engage their early primary-school aged children in literacy skills-building activities outside of school hours. The product (known as MobiLiteracy, or MLIT) delivers multimedia (SMS+audio) content on a daily basis over a sustained period of time—in this case, 91 days, during which all of the letters of the Luganda alphabet are introduced as well as 10 key vocabulary words all related to a short story. In May 2013, recruitment of participants and a baseline assessment of reading skills were conducted, after which the MLIT product was delivered to parents. At the end of the 91-day period (September 2013), endline data collection took place in Wakiso district of urban Kampala to measure any increase in skills among the program participants and gather feedback about use of the product. Implementation involved an experimental research design in which three separate groups of parents and their Primary 1 (P1, or Grade 1) or Primary 2 (P2, or Grade 2) children were randomly assigned to one of the following groups.

- **Group A – Mobile phone content:** Provided with a mobile phone and the MLIT 91-day SMS+audio product delivered to the phone daily.
- **Group B – Paper-based content:** Provided with a paper-based version of MLIT, which is a printout of all of the audio and text messages delivered to Group A.
- **Group C – Control group receiving one-time verbal literacy message:** Not provided with any literacy materials or support. At the time of assignment into the different groups, provided with a brief, one-time verbal message to support children's literacy (i.e., talking to children daily about school, letters of the alphabet, letter sounds, etc.).

The endline sample consisted of 94% of the people who signed up and were interviewed or assessed at baseline, or close to 50 parents and 50 students in each research group.

Findings

Participation. The expectation for parents in Group A was that they would receive, download, and listen to one audio SMS per day for 91 days and do the activities that the message suggested with their children. The expectation for parents in Group B was that they would use the printed materials daily for 91 days and engage their children in the suggested activities (which were equivalent to those suggested by the SMS program).

[1] At the time the grant was awarded, the company also went by the name Urban Planet Mobile (UPM).

The expectation for parents in Group C, the control group, was that they would spend time each day with their children engaging in literacy-promoting activities.

According to children's reports, about 40% of children in all groups actually engaged in the program on a regular basis. Parents' reported participation was higher than children's, and both student and parent reports indicate that the mobile delivery mechanism prompts parents to do activities more frequently and consistently with their children than a printed program or simple verbal recommendations. However, there are also more possibilities for this medium to fail due to technological constraints, and these are much harder to overcome than with other types. As a consequence, parents may be less willing to re-use the mobile program.

Yet equally important is the fact that many parents reported participating actively regardless of the format of the content. This indicates a strong willingness of parents to be more involved in their children's education and an appreciation of any guidance that they can get. This engagement on the part of parents may also affect more than one child in the family, or even more than one family in the case of mobile phone use—more than half of participants in Group A said they shared the download link with someone else.

Overall, parents and children expressed satisfaction with MLIT in all of its forms, and parents support its expansion to more parents and students; however, many factors unrelated to the design of the materials prevent parents from engaging with their children on a regular basis in literacy-promoting activities. These factors include lack of time, poor health, being away from the child for a period of time, and lack of familiarity with the methods. 90% of parents in the mobile group, compared to 80% of parents in the paper group, said that they would use the program again even if they had to pay for it. Parents in the paper group placed more value on the amount they would be willing to pay, with 41% saying they would be willing to pay more than 4000 shillings (about $1.50) for the product. Only 31% in Group A said they would pay 4000 shillings or more for the mobile product; the majority (63%) said they would pay less than 2000 shillings.

Learning gains. Mean increases in measures of reading ability were quite small across all groups. However, both the mobile and paper groups showed larger gains than the control group in all cases except syllable segmentation. For nonword decoding, only the paper group showed a larger increase than that of the control group. Some of these gains are less pronounced, or even disappear, when the means are calculated without including zero scores. However, the paper group still shows increases and strong effect sizes (>.40) in nonword reading and listening comprehension when zero scores are removed. Both mobile and paper groups show a moderate increase in familiar word reading when zero scores are removed.

On the other hand, the percentage of zero scores decrease across all subtasks for groups A and B, whereas they tends to increase for children in the control group. This change is particularly notable for the letter sound identification subtask where after the intervention, there were about 40% fewer children in Group B who could not give one

single correct response, and 32% fewer in Group A. Compared to group C, where the percentage of children with a zero score actually increased, this represents a sizeable effect that is most likely attributable to the intervention.

Taken together, the various types of analyses of the endline results show a similar trend—the intervention groups showed greater overall improvement than the control group, and the group that received MLIT on paper generally showed greater improvement than the group that received MLIT by phone. We can conclude that the opportunity to engage with a parent on a regular basis using specific content had a marked improvement on early literacy skills, especially for children who needed it the most—those with little to no demonstrated reading ability at baseline. However, the actual gains do not necessarily reflect the extent of the MLIT content—all letters of the alphabet and 10 key words—and are overall very small. The instruments used, and particularly the sample size of the study, do not allow us to isolate exactly what aspect of the program or what type of parental involvement was most powerful. We can be relatively certain, by using regression techniques, that the changes were due to the program and not to other factors such as home and school environment or socioeconomic status.

Challenges to use of the program. Based on the quantitative and qualitative evidence from the assessment and related survey instruments, use of the mobile program may have been hampered by the following.

- **Time**. Parents found it hard to find time to work with their children daily, and over the course of the program, may have had periods of time where they were away from their children for days or even weeks and therefore could not conduct the activities. This includes time when either the parent or the child was sick and could not engage in the activities for that reason.
- **Technological problems**. Accessing a daily message requires several steps—receiving the message, downloading/saving it to the SD card, then accessing the file on the SD card and opening it. This process was unfamiliar to most users who had experience only with voice calls or sending/receiving SMS. Therefore some people forgot how to access the messages, did not know they could repeat them, did not realize that the message queue could run out of space, etc. Overcoming these barriers required making contact with the program or someone else, and given the above-mentioned constraints with time, parents may not have had the ability to keep up with the program once technical problems were encountered.
- **Motivation**. According to some of the open-ended questions and the informal interviews conducted with parents on the day of endline data collection, some children lost interest in the program after the beginning or were simply not motivated to participate. For both parents and students the motivation to use the program was entirely intrinsic—there were no rewards, nor was performance recognized by the school in anyway. Participating in the research program might

have created some extrinsic motivation, since they knew that the researchers would be coming back to test the students later (see the paragraph on "Hawthorne effect" in Section 2.3 "Limitations".)

The instructional effect of the materials may have also been improved if the following were done.

- **Materials**. There were no print materials for the mobile group to look at that corresponded to the content of the program. The only print supports were the letters on the keyboard and once a week one of the file downloads was named with the key word of the lesson (for example, "kaapa.amr"). The rest of the file names were numbered, e.g., "lesson_17.amr". The actual SMS notification message stated only the download link, e.g., "MobiLiteracy Uganda http://slooce.net/lesson 31.amr"). This may explain the slight advantage observed by the print group. However, parents in the mobile group also frequently expressed that they would have liked to have books or reading materials to go with the program, or a print backup in case of message failure.
- **Content**. Feedback from assessors and even parents in the program at endline indicated that there were inconsistencies in the spellings of some of the key words. Also, RTI noted upon hearing the audio message for the first time that the program was teaching children an incorrect form of the letter sounds (see Limitations). Had the program been teaching the "pure" letter sounds (i.e., "S" makes the sound /ssss/ not /sa/) we might have seen more of an effect on the letter sound subtask. Further review of a complete translation of the content of the mobile program might uncover other aspects of the content that could be improved for more instructional effect. Furthermore, some interactivity was expected with the mobile phone format, but this was not included. This might also have had an effect on motivation.

Recommendations

We can broadly conclude from this program that providing a daily supportive routine can help parents increase their engagement in reading activities at home, and using mobile phones can be effective in provoking this regularity. Use of these materials is also associated with increases in student learning outcomes on measures of early reading skills. However, a similar program in a printed format is equally valued and used by parents and can also make a difference in students' learning outcomes. Having established that learning gains are comparable between the two formats (paper and mobile), there remain other reasons to pursue a mobile-phone based program: potential for scale through ease of distribution and the advantage of the audio format for reinforcing sounds, syllables, and specific word pronunciation. For this reason, and because the MLIT-mobile product is the object of this evaluation, the following recommendations concern only how to improve on the mobile product.

To improve participation and use of MLIT:

- Seek a technological alternative that reduces the steps required to access and open an audio lesson, and reduces dependency on a data plan and connectivity. If such an alternative is not possible without creating other costs or complications, then the orientation to the program must be improved to make the process more clear and provide more tips for troubleshooting in case of errors or problems.
- Involve more than just one household member, especially sisters and brothers, and the targeted P1/P2 child him or herself in the orientation process. Additionally, expanding to even younger children—those with little to no prior alphabet or phonemic awareness skills—could be beneficial as a school readiness activity.
- In addition to providing more effective guidance on how to use the mobile phone program, the orientation/training could provide participants with an actual demonstration of how to use the content with a child.
- Utilize parents who have already participated in the program to spread the word and provide support to other parents may be the best way to expand adoption of the product as well as technical support related to its use.
- Explore how the program could take advantage of older youth in the community to distribute and carry out the lessons with younger children.
- Identify solutions for users to overcome technical difficulties with access or retrieval of the audio messages, and develop a failsafe solution to identify and rectify complete breakdown of the system at the origin.
- Integrate interactive elements such as games or quizzes to generate more interest in and foster participant engagement with the content.

According to data in this study, frequency of engagement in general types of literacy-promoting activities is not enough to have an effect on student outcomes. However, engagement with the specific content of the program does. Therefore parents who are willing to help their children at home need very specific and relevant content to use to work with their children. This instructional content has to be adequate (i.e., evidence-based pedagogy of reading in the local language) and it has to be effectively implemented by the parents.

To improve the instructional content of MLIT:

- Address the issue of letter sounds and spellings of the words used in the program. The program materials must be re-recorded to ensure that scale up of the materials is not perpetuating an incorrect understanding of letter-sound correspondence.
- Provide more text-based resources to read. For example, the product could make better use of the actual text of the SMS messages, or the audio lesson file name could always include a key word or phrase, rather than just periodically.

- Provide access to actual printed resources, for example, a two-sided, laminated card with both instructions and content support on one side and the letters of the alphabet, the key words and images on the other side.

About this report

The MLIT evaluation is designed to allow for a comparison of the effects on reading acquisition of providing parents with content through SMS+audio against the outcomes of providing content via paper-based literacy materials, as well as against outcomes resulting from simply providing one-time verbal encouragement and suggestions to parents about supporting children's literacy development. The purpose of this mixed internal-external evaluation is therefore to (1) assess the effect of MLIT-Uganda in improving parental support for literacy in the home and in improving early grade reading ability in Uganda; (2) describe particular aspects of the product design and use, and determine their link to program outcomes; and (3) use the data and results to inform potential scale-up.

Section 1 provides some background on the program research framework, sample, and findings from baseline data collection.

Section 2 provides methodological details about endline data collection.

Section 3 provides data from the endline evaluation with which we can answer the key research questions:

1. To what degree did parents implement the proposed activities with the print-based and SMS+audio based materials?
2. Does participation in a structured reading program change parents' attitudes and engagement in reading with their children?
3. Does this change in attitude affect the nature of their engagement (type of literacy activities they do)?
4. To what degree did that engagement improve students' reading skills?
5. What are minimal contextual prerequisites for the two-way SMS+audio literacy program to be successful?

Finally, **Section 4** discusses overall conclusions about the MLIT-Uganda product and implications for the anticipated Phase 2 scale-up.

I. Background

1.1 Introduction and research framework

In 2012, Urban Planet Media and Entertainment Corporation/Urban Planet (UP[2]) was awarded a grant through All Children Reading: A Grand Challenge for Development. The grant awarded to UP was used to develop, pilot test, and evaluate an early literacy product in Uganda that targets parents through their mobile phones and encourages them to engage their early primary-school aged children in literacy skills-building activities outside of school hours. The product, which was delivered in the Luganda language, delivered multimedia (SMS+audio) content on a daily basis over a sustained period of time—in this case, 91 days, during which all of the letters of the Luganda alphabet were introduced as well as 10 key vocabulary words all related to a short story.

The program involved several partners (See ***Annex B*** for complete roles and responsibilities):

- **UP** was the prime awardee for this grant program and designed the content and distribution method for a literacy development program tailored to the Ugandan context, and for evaluating it in the context of the grant program.
- **RTI International** was designated to lead the evaluation of the program's effects on students' reading skills and home-based literacy practices, as well as its potential for scale-up.
- Local partners **Mango Tree** and the **Center for Social Research (CSR)** were recruited to manage the local logistics of program implementation and evaluation activities.

The MobiLiteracy (MLIT) evaluation program is designed to determine the effectiveness of the MLIT SMS+audio product and to allow for a comparison of the effectiveness of strategies for providing variations of that product to parents to help them encourage reading acquisition. The strategies evaluated include SMS+audio lessons or literacy prompts delivered via mobile phone, the same prompts provided to parents in paper format, and a one-time literacy prompt delivered to parents verbally at the beginning of the program. This one-time prompt strategy operates as the control in the evaluation. The MLIT evaluation was conducted in two phases:

- Phase 1: Focused on evaluating the MLIT SMS+audio (referred to as 'MLIT mobile' vs. 'MLIT paper' throughout this report) product and its effects on literacy development when provided free of charge to parents through organized, school-based recruitment. (May through December 2013)

[2] At the time the grant was awarded, the company also went by the name Urban Planet Mobile (UPM).

- Phase 2: Will focus on evaluating the feasibility of taking the program to scale by offering it at a small cost to parents. (January through September 2014)

A baseline report submitted dated July 31, 2013, described the outcomes of the Phase 1 baseline data collection. A brief summary of baseline findings are included later in this section. The remainder of this report describes the findings from data collected at endline, after the 91-day program had been completed. A third report after Phase 2 will also be produced to discuss the potential for scale-up based on findings from implementation in Phase 2.

Research framework

The MLIT evaluation is designed to allow for a comparison of the effects on reading acquisition of providing parents with content through SMS+audio against the outcomes of providing content via paper-based literacy materials, as well as against simply providing one-time verbal messages to parents about supporting children's literacy development. The evaluation proceeds through a randomized controlled trial (RCT) involving two treatment groups and one control group, and measurement of differences in outcomes (namely children's reading achievement) over time and between groups. The groups consist of parents and their Primary 1 (P1, or Grade 1) or Primary 2 (P2, or Grade 2) children, who were randomly assigned to one of the following groups.

- **Group A – Mobile phone content:** Provided with a mobile phone (to be returned at the end of the program), verbal instructions and in-person demonstrations for using the phone, and the MLIT 91-day SMS+audio product delivered to the phone daily. Provided with follow-up technical support (one-time visit to schools and by mobile phone).
- **Group B – Paper-based content:** Provided with a paper-based version of MLIT, which is a printout of all of the audio and text messages delivered to Group A, as well as basic (verbal) instructions for using the materials. Does not receive on-going training or support unless requested.
- **Group C – Control group receiving one-time verbal literacy message:** Not provided with any literacy materials or support. At the time of assignment into the different groups, provided with a brief, one-time verbal message to support children's literacy (i.e., talking to children daily about school, letters of the alphabet, letter sounds, etc.). Does not receive on-going training or support.

This "difference-in-differences" evaluation approach—comparing both differences over time and differences between groups—will allow us to isolate the effect of MLIT delivered by mobile phone as compared to paper-based delivery and the control group. A product-oriented approach built in to the evaluation will further allow for a formative evaluation of the product while it is being tested.

The logic model behind the MLIT-Uganda approach is that children can improve their skills when parents become involved in the process. This is a way to increase time spent

learning and to create a supportive culture of learning and literacy in the home, all of which have a proven positive association with student achievement. Needless to say, the quality and quantity of parental involvement is also a key factor in this causal chain, and the MLIT-mobile program is designed to give parents simple, straightforward lessons in a format they can understand (quality) on a daily basis (quantity). By using audio text messages, the parents receive content they can use with their children even if they do not read themselves. By using mobile phones as the mechanism for delivery, the program can reach scale more easily than other methods (for example, a tutor) by being more conveniently accessible than other methods (for example, radio or television broadcasting which are limited to a certain time and date, and not repeatable on demand). As reported in the baseline findings, 87% of parents sampled have access to a mobile phone. While this figure is higher than other national reports of mobile phone ownership in Uganda due to the largely urban sample, all analysis points to a growing mobile market nationwide.

Although ultimately the evaluation of the MLIT program aims to determine whether children with the MLIT-mobile program improved their reading ability more than children who did not have the mobile program, several other related research questions help to isolate whether the original logic model was accurate, whether any results can be attributed to the MLIT content, or in the absence of positive outcomes in reading ability, whether there were any other positive effects of the program that could help inform the design of future initiatives.

Therefore, the key research questions that informed the evaluation design were:

1. To what degree did parents implement the proposed activities with the print-based and SMS+audio based materials?
2. Does participation in a structured reading program change parents' attitudes and engagement in reading with their children?
3. Does this change in attitude affect the nature of their engagement (type of literacy activities they do)?
4. To what degree did that engagement improve students' reading skills?
5. What are minimal contextual prerequisites for the two-way SMS+audio literacy program to be successful?

1.2 Summary of baseline findings

Data were collected in May 2013 from participants in a sample of eight co-ed public schools in the Wampewo Coordinating Cluster, an education administrative geographic unit within the district in the Wakiso District of peri-urban Kampala. Participants from each of the three groups (treatment and control) were selected at each school to maximize the likelihood that participants would be as similar as possible to each other, to mitigate any potential unobservable differences related to school administration, conditions, and

quality that may have an effect on outcomes. Matching student and parent[3] interviews were collected for 158 participant pairs; in a few cases, a parent was interviewed but the child was not, or vice versa. In total, 55 parents were assigned as participants and received materials in Group A (the mobile group), 56 in Group B (paper-based group), and 57 in Group C (control group). There were fewer participants in the mobile phone group than in the paper or control groups because of unanticipated problems issuing phones to a few women, who declined to participate in the program. The participants received orientation and materials between June 3 and June 18, and delivery of messages for the mobile program began June 15.

Participant characteristics at baseline

Responses to the oral questionnaire reveal that 91% of participating parents were female. Most participants in the program were mothers, followed by an aunt/uncle or grandparent. Fathers were also involved (7%). The average age was 35. Eleven percent (11%) of parents reported attending an adult literacy program in the past, and 80% said they read and write Luganda well. Of note is that at least a third of parents, however, were not literate (by their own admission or by the assessors' observation). Families in all three groups had a similar socioeconomic profile based on an index ranging from 0 to 100—the average in each group was close to 48, but the distribution of the index values ranged from 16 to 70. Families were not the poorest of the poor, but were all in a similar socioeconomic range based on self-reported characteristics that revealed them to be about 50% likely to be living below the poverty level.

Student reading skills

Children's reading ability at baseline was assessed using the Early Grade Reading Assessment (EGRA) developed for the Luganda language. Specific skills tested were letter sound knowledge, syllable segmentation, familiar word reading, non-word decoding, and listening comprehension.

Results showed that the reading skill level of children in all three groups was similar, with no group showing a particular advantage at baseline. A large proportion of children in each group (mobiles, paper-based, and control) did not provide a single correct letter sound during the exercise, and of those who did, the largest proportion gave fewer than 10 correct letter sounds per minute. Similarly, more than half of the children could not correctly read any of the 10 'familiar words', which will be included in the MLIT program. For each individual word, no more than 25% of the children could read that word correctly. Even more children—more than three-quarters—could not decode even one non-word using letter-sound correspondence. The results therefore indicate that children are in need of reinforcement in skills that are a focus of the MLIT program. A standard questionnaire administered to children after the reading assessment further

[3] For the purposes of the report, we will refer to the adults in the matched pairs as the "parent", although sometimes it was an aunt, uncle, grandparent or other adult associated with the household.

indicates that the characteristics of children across all three research groups were similar, with a few exceptions (though none is statistically significant).

Literacy-promoting behaviors and attitudes in the home

Characteristics of children and families were also very similar across groups. There was an equal distribution of P1, P2, and P3 children in the groups. Families mostly spoke Luganda at home and demonstrated some Luganda and English reading ability, equally distributed across groups. Parents reported engaging their children in a range of literacy promoting activities such as learning letters, telling stories, and teaching word reading; however, a small proportion read stories aloud or asked the children to read stories aloud. There was a presence of Luganda reading materials in the home, particularly religious books and newspapers. Children's storybooks or school books were more likely to be in English though.

A large majority of parents were already mobile phone users, and it was common for them to make and receive phone calls or send and receive SMS messages. Sharing SMS messages with children, however, was not common.

Very few of the differences between groups (whether student skills or self- and home characteristics) are statistically significant. Therefore we can conclude that, at baseline, treatment and control groups were similar, and all children and parents showed similar need for the MLIT content and a measurable margin for improvement.

For further details of the baseline findings, as well as research design, methodology and instruments, please refer to the baseline report.[4]

II. Endline methods

2.1 Instruments and fieldwork

To answer the research questions, qualitative and quantitative information was gathered using three key instruments: student reading skills assessment (based on the Early Grade Reading Assessment [EGRA] methodology[5]), student interview, and parent interview. The same EGRA subtests and items were used at the end of the 91-day program in order to ensure equivalency in difficulty between baseline and endline, with only minor changes to the order of presentation of the items. The listening comprehension story was changed slightly to avoid possible bias from having already heard the story once. Additional questions specific to program implementation (e.g., training, use of materials, difficulties encountered, etc.) were asked at endline in order to inform future improvements and help explain the outcomes. Information from these instruments will help determine if reading levels and literacy-related practices have changed due to

[4] Pouezevara, S., Pflepsen, A. and King, S. (2013, 31 July). *MobiLiteracy-Uganda Program Phase 1: Baseline Report*. RTI International, Project Number: 0213750.000.000.
[5] For more information, see www.eddataglobal.org, or refer to the baseline report for this study.

program participation, and what specific implementation factors are associated with changes in outcomes. See ***Annexes C*** and ***D*** for copies of the endline instruments.

Endline data collection took place in Uganda the week of September 30 to October 4, 2013. Assessors were trained for three days, September 23 to 25. Four out of the six assessors were also the baseline data collectors (see above). Two assessors replaced those who were unavailable due to other fieldwork, but these replacement assessors were already familiar with EGRA administration procedures. Two teams of three assessors and one coordinator visited one school per day for the first four days. The fifth day was used to return to schools where some parents or students had been absent on the day of the first visit. The period of fieldwork corresponded to the first week of the third term of the school year. According to the school calendar, the first week of the term should have begun September 15, but the teachers were on strike until September 26. With the help of head teachers in the school and the local project coordinators from the organization Mango Tree, parents were informed in time to come to school on the scheduled day, and nearly all of the sampled parents and students were present (see next section, Sample Size).

The data collection began 105 days after the MLIT mobile messages started being delivered (June 15). The parents in the paper program had the printed materials one to two weeks earlier; similarly, parents in the control group had their orientation to the program earlier (the week of June 3). The 91-day program had just been completed when the endline data collection took place. However, there was a period of one month at the end of August and beginning of September where messages were not being sent due to a technical difficulty. Therefore from September 16 until September 29 the mobile participants received two lessons per day in order to complete the cycle without further delaying the data collection.

Sample

The research design sought to collect data from 192 "participant pairs" (e.g., a parent and his or her child) across 8 schools. By selecting children from intervention and control groups within the same school, there was a greater likelihood of being able to control for differences between schools, teachers, and communities. In each school, the local program coordinators recruited 24 pairs to be randomly assigned and evenly distributed to one of each of three research groups. The parents were not told which group they would be assigned to; the only requirement for participation was that they be Luganda speakers and that they have a child in P1 or P2. Parents who volunteered were asked to come back to school for interviews on the scheduled day of baseline data collection. (See Table 1, row 1).

On the day of baseline data collection, some parents or students who had originally volunteered were not present because they could not be reached, they were out of town, or they had other issues that prevented them from being at the school at the designated time. A second follow-up visit attempted to gather the data from the missing individuals,

but some were still unavailable. Baseline results included only information from participant pairs for whom both interviews were complete. Parents who were interviewed at baseline were given another date on which to come to school to be assigned to their group and receive materials. (See Table 1, row 2).

On the scheduled day of orientation and distribution of materials, some parents showed up but then declined to participate when they learned they would be in the mobile phone program. Other parents did not show up and were unreachable for further follow-up, therefore they never received the orientation and were considered drop-outs. (See Table 1, row 3).

A week before the scheduled endline data collection (after the 91-day program had been delivered), local program coordinators contacted the schools and parents who had received orientation and materials and scheduled a time for them to come for post-program interviews. At this time, some parents did not show up due to other commitments, and some children were not in school, further reducing the final sample. Thus, the actual number of students and parents interviewed at baseline and endline was less than the original anticipated sample due to unexpected absences or drop-out for various reasons. (See Table 1, row 4).

Table 1, below, shows the evolution of sampling from baseline to endline.

Table 1: Evolution of sample from baseline to endline

	Group A – Mobiles		Group B – Paper		Group C – Control		Total Eligible
	Students	Parents	Students	Parents	Students	Parents	
1. Recruited	64	64	64	64	64	64	384
2. Present at baseline	62	58	61	59	58	57	355
3. Received orientation	n/a	55	n/a	56	n/a	57	336
4. Present at endline	54	48	56	50	54	51	312
Total matching participant pairs at endline	47	47	49	49	50	50	292

For endline data analysis only students who had both a baseline and an endline assessment were included in the database, along with the corresponding parent interviews when the parent was present. For this reason, the data on student scores includes a higher number of respondents then the data on parent participation and regressions using parent responses, since in some cases there was not a parent interview. If not otherwise mentioned, the sample size (n) in the analyses presenting student scores is 54 (Group A), 56 (Group B) and 54 (Group C). The table shows that 94% of the people who signed up

and were interviewed or assessed at baseline were also interviewed at endline. The distribution of this final sample of parents and students who have comparable interviews at baseline and endline across schools and research groups is as follows (***Table 2***).

Table 2: Total number of matched pairs used for endline data collection, by school

School	Group A – Mobiles		Group B – Paper		Group C – Control	
	Baseline	Endline	Baseline	Endline	Baseline	Endline
1	6	6	6	6	5	6
2	5	5	6	6	8	7
3	7	8	4	4	6	6
4	6	6	8	8	8	7
5	6	6	7	7	7	5
6	6	6	7	6	7	6
7	6	4	7	6	7	6
8	8	6	8	6	7	7
TOTAL	50	47	53	49	55	50
Retention rate from baseline to endline by group:		94%		92%		91%

Although retention was highest for parents in the mobile group, and lowest for parents in the control group, we have no direct reason to believe that attrition had anything to do with the group to which participants were assigned. However, parents in the mobile group were required to return the phone, and parents in the paper group were asked to bring the paper booklet to show the researchers, so it is possible that many more parents in these groups showed up on the day of endline data collection for that reason.

Note that retention in terms of sampling (i.e., interviews conducted at each stage) is not to be confused with actual level of participation in the program. The extent to which some parents stopped doing the activities with their children at some point between baseline and endline data collection—even if they may have shown up for the endline interview—is explained in more detail in the findings section (Section III) of this report.

Characteristics of the sample

Parents. As described by the process above, some parents declined to participate in the program or were otherwise not present at endline data collection. In some cases, a different person might have taken on the responsibilities of the individual who was interviewed at baseline, and it was that person who was interviewed at endline. During the endline data collection, we calculated that 7 parents were not the same as the person interviewed at baseline (based on their own self report; these were 4 from Group B and 3

from Group C). Despite these substitutions, the overall characteristics of the sample remained similar: First, 91% of adult participants were female. Second, the relationship of the participating adult to the child was still largely mothers (65% at baseline and 67% at endline), and the proportion of participants in each category was similar in groups A and B. Some more noticeable changes were in Group C (where the absolute number of participants declined the most, from 54 to 45)—the proportion of mothers declined from 69% to 64%, and the proportion of aunts/uncles from 20% to 11%, but the proportion of fathers increased from 4% to 16% and grandparents from 4% to 9%. The percentage of fathers participating in Group B also increased from 9% to 14%. This change was not due to substitution—of the 7 parents who were substituted at endline, they were all female family member replacing a female family member—but rather a reduction in the number of mothers, thus increasing the proportion of fathers. All fathers who were interviewed at baseline were also interviewed at endline.

At baseline, the parent sample was split nearly equally between participants who have completed P6 or fewer years of education (52%) and those who have completed P7 or higher (48%). This was the similar among the endline sample: 50% of parents in Groups A and B, and 49% in Group C had completed more than 6 years of schooling. Analysis of the group composition and change between baseline and endline shows that there is no significant difference in level of schooling by group.

Students. The children in the sample were boys and girls, mostly from P1 and P2. (Some students in P3 were allowed in the sample at baseline when there weren't enough participating parents and the children were found to have a low level of reading ability). There were slightly more girls (55%) than boys. While the distribution of children from each grade level was nearly equivalent across the three research groups, there were more girls in the control group and fewer in the mobile group (See ***Figures 1*** and ***2***, below).

Figure 1: Sex of students in the sample

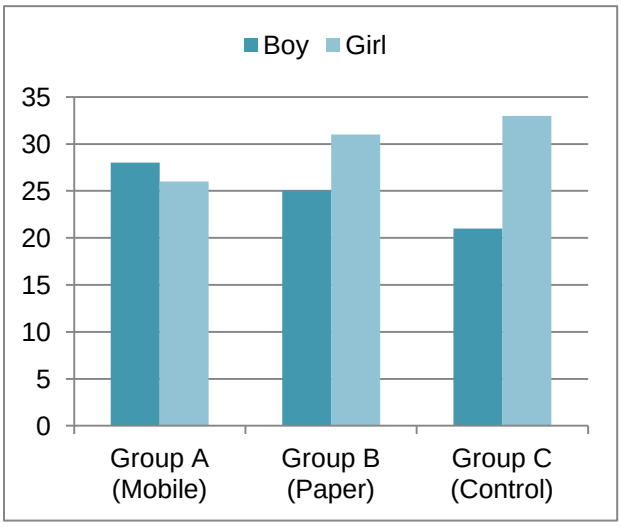
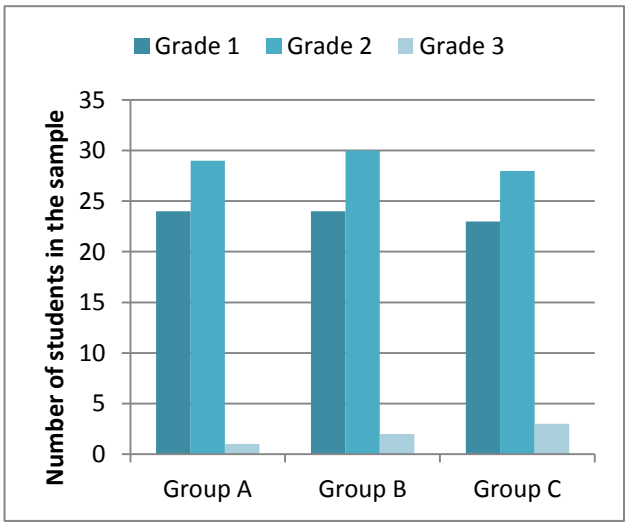


Figure 2: Grade of students in the sample



The average age in the endline sample was 7.7 years in Group A, 8.3 years in Group B, and 8.2 years in Group C. Comparison of baseline and endline samples showed that there was no significant difference in age or change of age among the groups between baseline and endline.

As a reminder, the baseline data collection determined that few of the differences between groups (whether student skills or self and home characteristics, including socio-economic status) were statistically significant. Therefore we concluded that treatment and control groups were comparable for research purposes. Since there was some dropout between baseline and endline (and furthermore, some substitution of the participating adult in the interview), the characteristics of the groups also changed slightly; however, overall similarities remain the same and where major differences exist (i.e., gender), regression techniques have been used to determine whether these are characteristics that are associated with student outcomes across the whole sample and thus can explain the differences in research groups. These findings are described in more detail in Section III. The next sub-section describes the data analysis process in more detail.

2.2 Data analysis

The main analysis is driven by the research question of determining the impact of the treatment of the research groups, in comparison to each other as well as to the control group. As such, the means of the subtest scores for each group are calculated at baseline and endline. Differences are then calculated between the means for each research group and the control group means for each subtest, and the endline difference is subtracted from the baseline difference. Therefore, we obtain an estimate of the improvement of the research group subtest score means versus the control group subtest score means between baseline and endline. An effect size is calculated for each estimate, which is the estimate in the form of pooled standard deviations, thus standardizing the estimate for comparisons across subtest scores.

Throughout the report, where comparisons are made between baseline and endline, the percent increase calculation shows how much larger the gains of the intervention groups are than the gains of the control group (where there were any gains in the control group). This helps distinguish gains in ability that are most likely due to the intervention from overall gains made by the entire population for reasons other than the intervention. The effect size is a measurement of how important that gain is given the distribution of scores in each group. Generally, any effect size larger than 0.4 is worth noting, since this means that two-thirds of the individuals in the control group would fall below the average person in the experimental group.[6] P-values[7] are still calculated in this difference of differences approach, but this value (difference of differences divided by the standard

[6] See http://www.leeds.ac.uk/educol/documents/00002182.htm

[7] The p-value is a statistic used to measure the probability, or likelihood, that a particular measurement or occurrence is a result of chance. In evaluation studies, p-values are frequently used to compare groups to identify whether specific characteristics are the result of random chance, or if they are likely due to an innate difference between the groups.

deviation) is usually aligned with the effect size and therefore may appear redundant. Nevertheless, where applicable, p-values have been indicated using a standard annotation (`=p<0.1, 'trend'; * = p<0.01, 90% confidence level; ** = p<0.05, 95% confidence level; *** = p<0.001, 99% confidence level.)

2.3 Limitations

Every research program has some limitations to the reliability and generalizability of the results. Some of the limitations of this study are related to the sample size and conditions of the data collection, as well as the assessment instruments. First of all, it is unlikely—but possible—that there was some contamination between research groups, since intervention and control subjects were selected from within the same classrooms. When children in the intervention groups (A and B) were asked whether they had ever talked about the MLIT activities with other children in their classroom, 20% in Group B and 17% in Group A answered "yes". It is unlikely that students would have actually shared the materials (the audio messages or printed materials) with other children in the class, or directly taught the skills to other children in the class, but they may have talked about things they were learning related to letters, letter sounds, and words, and this may have created some indirect motivation for children from another group to pay more attention to reading during the study period. However, as mentioned previously in the Sample section, the decision to select students from all three research groups from within the same school was intentional in order to limit other confounding effects that might have come from having the groups come from separate schools.

Second, all research is subject to the limitation of "the Hawthorne effect." Just by knowing they were part of a research program, and that researchers would be coming back after a certain period of time to determine if any learning took place, parents and students in the sample may have made an extra effort to use the program materials or improve their reading skills regardless of the group they were in. Because of this effect we may not be able to assume that because a certain format (i.e., mobile or paper) is successful during the research period, it would be adopted with the same amount of ease or intensity when it is not part of a research program being monitored by someone.

Next, as reported at baseline, there was some difficulty in developing the assessment instruments due to inconsistency in the way that some Luganda words are spelled and pronounced. Among the 13 words used for the familiar words subtest (10 assessment items and 3 examples) in the reading assessment instrument, 7 had contentious spellings. Because the reading program, including audio recordings, had already been developed, the evaluation instruments used the same spellings as in the MLIT materials. The different spelling possibilities resulted in difficulty in obtaining agreement among assessors about acceptable pronunciation of the words and so could affect the ability of the instruments to detect actual learning gains among the children.

Similarly, for the letter sounds subtask, children are asked to give the sound of the letter, and a correct answer is considered to be the "pure" letter sound in isolation—for

example, /t'/ as opposed to /ta/, /tuh/ or /tee/. However, during endline assessor training it was noted that the MLIT materials were actually teaching an incorrect version of the letter sound—for example, the audio recordings indicated that, for example, the letter "M" makes the sound "ma" instead of "/m/". On paper, the sound was also introduced as, for example, *"J" ekola eddoboozi "ja".* The result is that there is a disconnect between what was taught by the program and what was measured (considered a "correct" response) according to the assessment; this is an important limitation in the evaluation's ability to detect changes. It is possible that the correct letter sounds were learned implicitly despite the way they were presented in the materials, and the difference between the two forms of pronunciation is not as much of a concern for vowels as it is for consonants; therefore the assessment subtest was retained and the results are being analyzed, but any gains—or lack of gains—on this subtest should be viewed with this limitation in mind.

Finally, the evaluation is comparing three different types of parental support—a message delivered daily to parents on the mobile phone, a printed booklet with a daily lesson to follow, and verbal recommendations to support the child's literacy (control group). The actual content of these three modes is quite different, and the actual conditions of implementation also varied beyond the control of the program. Ideally, data collection would have taken place as soon as possible before and after the delivery of the 90-day program (the start of the SMS message delivery and the start of the distribution of the paper program). However, for many reasons the timing was not so precise. First, the parents in the paper (and control) groups received the materials/advice up to 2 weeks before the SMS messages started being delivered. Then, due to the technical difficulty mentioned above, there was a period of one month where the messages were not delivered at all. The result is that the parents in the paper program may have had their materials up to 120 days total, and the parents in the control group also had 120 days in which they could have been doing activities with their child, whereas the mobile group had only the 91 lessons total, and towards the end they were receiving two messages per day. In the case of the paper and control group, having the extra time does not necessarily mean that they utilized it, but it does mean they *could have* (mobile participants could have also been repeating lessons during that time). So there is a potential bias in the implementation conditions towards those groups. On the other hand, if a parent in the paper group did the lessons one per day as planned, they might have also finished the lessons about three weeks prior to data collection, and so the material would not have been as fresh in the minds of the children as the mobile group, who finished the program just one day before data collection; thus a potential bias against the paper group but towards the mobile group. Most importantly, though, the key instructional theory behind the design of the mobile program is that regular daily prompts are an effective way to change behavior and reinforce basic concepts—in this case, early literacy concepts that build upon one another. Furthermore, this design is meant to allow busy individuals to integrate short lessons into their daily lives on a regular basis. By having a large gap in the learning process and then a more intense delivery of the messages toward the end,

these underlying design principles were not actually adhered to, and therefore the product that we are measuring the effect of is not the same product that would necessarily be replicated in the future.

III. Endline findings

3.1 Was MLIT-Uganda effective in improving parental support for literacy?

As mentioned previously, the key research questions that informed the evaluation design were:

1. To what degree did parents implement the proposed activities with the print-based and SMS+audio based materials?
2. Does participation in a structured reading program change parents' attitudes and engagement in reading with their children?
3. Does this change affect the nature of their engagement (type of literacy activities they do)?
4. To what degree did that engagement improve students' reading skills?
5. What are minimal contextual prerequisites for the two-way SMS plus audio literacy program to be successful?

In this section, we will look at the first three questions regarding program engagement. In **Section 3.2,** we will address the questions of whether students' reading skills were improved and if any improvement appears to be linked to the parental engagement. Finally, **Section 3.3** will look at some of the contextual factors that may have contributed to, or hindered, the success of the two-way SMS+audio approach to delivery.

To what degree did parents implement the proposed activities with the print-based and SMS+audio based materials?

Student self-reports. Students and parents were asked questions that aimed to determine the extent to which they actually engaged with the MLIT materials. The expectation for parents in Group A was that they would receive, download, and listen to one audio SMS per day for 91 days and do the activities that the message suggested with their child. The expectation for parents in Group B was that they would use the printed materials daily for 91 days and engage their child in the suggested activities (which were equivalent to those suggested by the SMS program). The expectation for parents in group C, the control group, was that they would spend time each day with their child engaging in literacy-promoting activities (such as those in ***Table 5***); there were otherwise no structured guidelines about length of time or specific content for Group C parents. All children in all groups were given a pencil and a small copy book as a token of appreciation for their

participation in the interview, but they were not instructed to use them in any way for the purposes of the program.

Table 3 summarizes the responses to specific questions about program participation that were asked of children in the A and B groups relative to the use of the program materials at home. One of the questions asked the child: "What was your favorite story?" as a way to determine whether they had engaged with the program. If a child gave an answer corresponding to content in the program, it was considered an affirmative response.

Table 3: Use of the MLIT product from students' self-report

Question	Percent of affirmative responses	
	Group A: Mobiles	Group B: Paper
Do you ever practice* letter sounds from this book (or phone)?	46%	40%
Did you ever practice writing letters from this book (or phone)?	46%	39%
Did you ever practice words from this book (or phone?)	41%	45%
Did you ever practice writing words from this book (or phone?)	45%	35%
Did you ever listen to stories read to you from this book (or phone)	45%	44%
Did you ever discuss the stories with anyone after listening to them?	34%	32%
Child could name a character or topic from one of the stories.	41%	34%
Did you do the activities every day?	9%	12%

* Unless explicitly asked about writing, 'practice' in this case is equivalent to 'do' or 'learn' or 'try', in an *oral* manner, though it is possible that sometimes children may have been referring to writing when they responded.

This table shows higher self-reported participation on 6 of the 8 measures by children in the mobile group. "Practicing words", was higher for the children in the paper group, and more children in the paper group said they did the activities "every day", though the percentage remains very small for both groups. The largest difference in the reported level of participation was when the children were asked if they ever practiced *writing* words from the materials; 10 percentage points more children responded yes in the mobile group (Group A) than the paper group. This is particularly interesting because during data collection, several adults who were interviewed from Group B (and one from Group C) brought samples of the writing that their child had done in the notebooks given as a gift after the baseline interview. Because we did not anticipate that parents would use the notebooks for this purpose, we had not systematically recorded how many parents in each group did this, but it is interesting that the students' reporting doesn't necessarily match this observed effect.

Overall, however, the level of participation is very similar between the two groups, and if student reports are reliable, they indicate that only 40-50% of the entire population

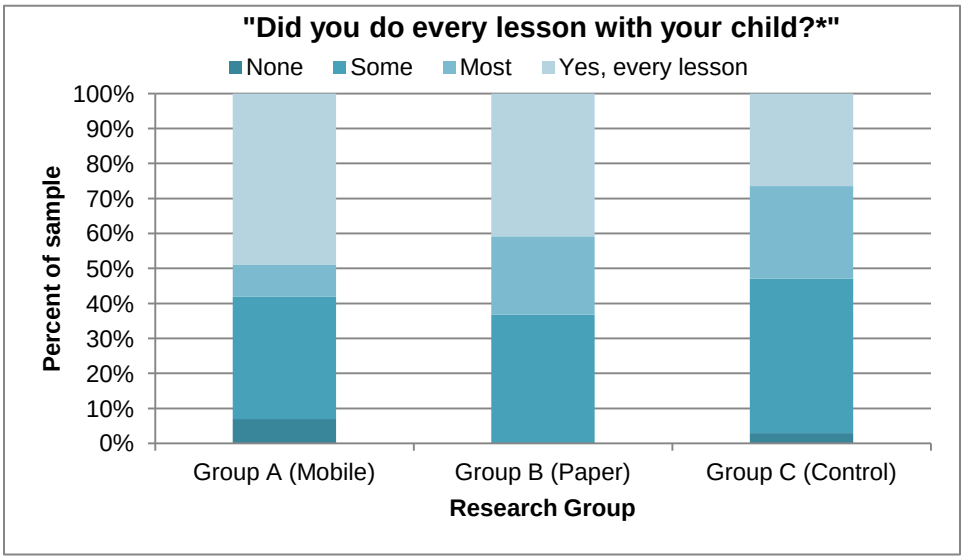
sampled actually participated in the program to some extent. This is important to consider when reviewing the results of the measures of student reading skills in the next section.

Children reported that most often they did the activities with their mother, but in cases where they did the activities with someone else, it was most often reported to be a sister or brother. The incidence of sister/brother conducting the activities with the child was much higher in Group A (13%) than in Group B (5%). Interestingly, 25% of children in both intervention groups reported that they sometimes did the activities by themselves (26% in the case of Group A). As shown in ***Table 3***, above, only about one in 10 children reported that they did activities every day, and this percentage was slightly higher for the B group (12%) than for the A group (9%). Otherwise, the proportion of children who reported doing the activities 'sometimes' was equivalent (34% for Group B and 31% for Group A).

Parent self-reports. Adult respondents were also asked certain questions designed to ascertain the extent of their engagement in the program activities. First of all, during the endline data collection process, while assessors were administering EGRA to the children, the program coordinators from Mango Tree were 'pre-screening' the parents. At this time, they collected the mobile phones and verified whether messages were downloaded; they reviewed the print materials, and they asked parents some basic questions about program participation using a structured protocol, but also through informal, friendly conversation. At the end of that interview, they made a judgment about whether the parent had actually participated in the program or not. In general, a parent would have had to admit himself or herself that he or she never did any of the activities with the child, but the additional clues would have helped to verify this. If parents had done even one lesson, then they would have been considered a participant. After this pre-screening process, the parent went through the structured interview with the assessors, but if the variable "Participant: Yes/No" was marked "No", then a series of questions such as "What was your child's favorite lesson" were eliminated, making the interview more efficient. Very few parents were actually identified as 'non-participants' at this stage: 6 in the mobile group, 2 in the paper group, and 0 in the control group.

Then, some additional questions posed by the assessors aimed to determine the extent of participation. Parents in Group A most often reported doing every lesson with their child, but they also most often reported doing *none* of the lessons (see ***Figure 3***). This is most likely due to the fact that technical difficulties with the phones (such as losing the memory or SIM card, or not understanding the functionality) were more difficult to overcome than with the paper program.

Figure 3: Extent of engagement with MLIT content, from parents' self-report



* or "Did you do activities every day with your child?", in the case of Group C.

Parents' reports of who did activities with the child is mostly consistent with what the children said—when it wasn't the mother, it was most often a sister or brother. This was the case across all groups but particularly more often in Group C (15%) compared to Group B (7%) or Group A (9%), see ***Figures 4*** and ***5***.

Figure 4: Did anyone else ever do the activities with your child?

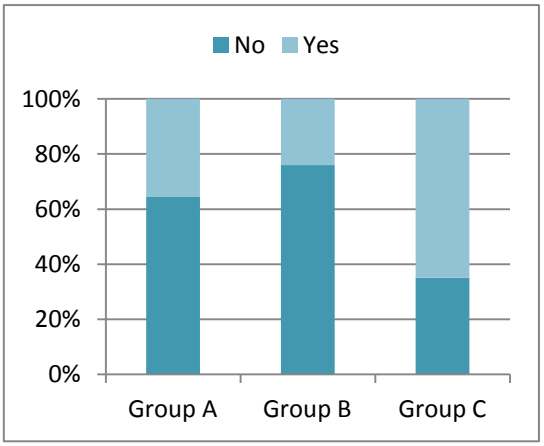
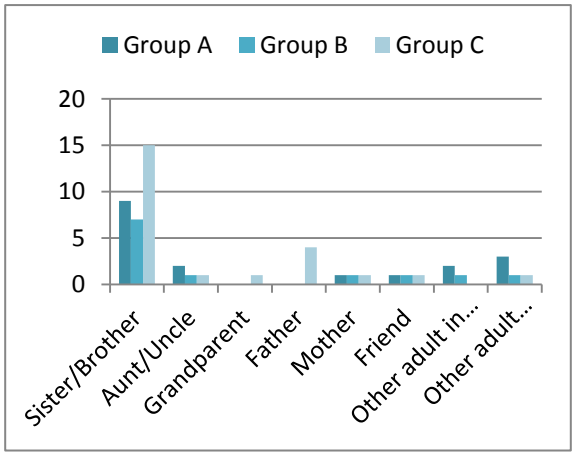


Figure 5: Who else did the activities with your child?



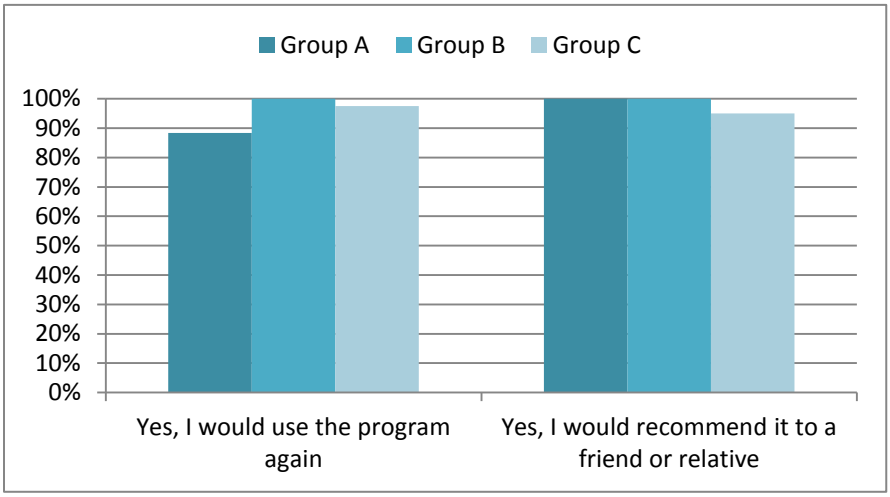
When asked specifically how many times per week they did the lessons, Group A parents were more likely to do the activities every day or more than once per day (49%) compared to Group B (36%) or Group C (19%). Parents in the mobile group were also more likely to repeat lessons. However, it is important to recall that towards the end of the program, the mobile participants were receiving two messages per day and so would

have been expected to conduct the activities more than once per day (see Limitations). Thus this question has to be interpreted with caution.

Specific issues that prevented parents in all groups from participating fully are discussed in more detail in Section IV. Within a "lesson" (the content expected for one day), there were also one or more "activities" requested of the parent; for example, have your child point to the letter on the phone keyboard, or have your child write the letter on the page. Parents in Group B more often reported doing all of the activities (77%) compared to Group A (64%). Across all groups, listening to or telling a story was the activity done most regularly. Children also reported that this was the activity they enjoyed the most. Around 30% of parents across all groups reported including other children in the activities; these were usually other children in the household, and it was usually between one to 3 additional children.

Parents also reported satisfaction with the program in terms of willingness to recommend it to a friend or relative, and willingness to use it again with other children, but these indicators were slightly higher for Group B (see ***Figure 6***).

Figure 6: Measures of parental satisfaction with the program



90% of parents in Group A, compared to 80% of parents in Group B, said that they would use the program again even if they had to pay for it. Group B parents also placed more value on the amount they would be willing to pay, with 41% saying they would be willing to pay more than 4000 shillings (about $1.50) for the product. Only 31% in Group A said they would pay 4000 shillings or more for the mobile product; the majority (63%) said they would pay less than 2000 shillings.

Fewer than 20% of participants in any group said that the number of lessons per week was too much, and this was slightly higher for the mobile group (16%) than for the paper group (10%). Again, this could be due to the fact that towards the end of the program period the lessons were delivered more frequently.

Interestingly, at baseline we noted that within Group B—the group that received MLIT in printed format—there were approximately a third of participants who declined to read the short story in Luganda. Although this does not necessarily mean they *can't* read, assessors were only able to observe 42% of parents in Group B reading "with ease", and 9% said they do not read and write any language well. Yet at endline, only one parent in Group B reported that lack of ability to read prevented them from participating in the program.

Summary. Given the above data, although parents' reported participation is higher than children's, it does seem that the mobile delivery mechanism prompts parents to do activities more frequently and consistently with their children than a printed program or simple verbal recommendations. This is consistent with other research on mobile 'microlearning', particularly programs for health behavior change.[8] However, this assumes that phones are receiving the messages and parents are able to access them. When something goes wrong in the chain of events leading to the receipt of a message, it is much harder to overcome than with other media. As a consequence, parents may be less willing to re-use the mobile program.

Yet equally important is the fact that many parents reported participating actively regardless of the format of the content. This indicates a strong willingness for parents to be more involved in their children's education and an appreciation of any guidance that they can get. This engagement on the part of parents may also affect more than one child in the family, or even more than one family in the case of mobile phone use—more than half of participants in Group A said they shared the download link with someone else. Children enjoy the storytelling aspect of the activities, more so than the activities that resemble schoolwork (e.g., writing words, or learning about letters and words at home), and this can guide the design of further interventions that seek to involve parents in their children's literacy development.

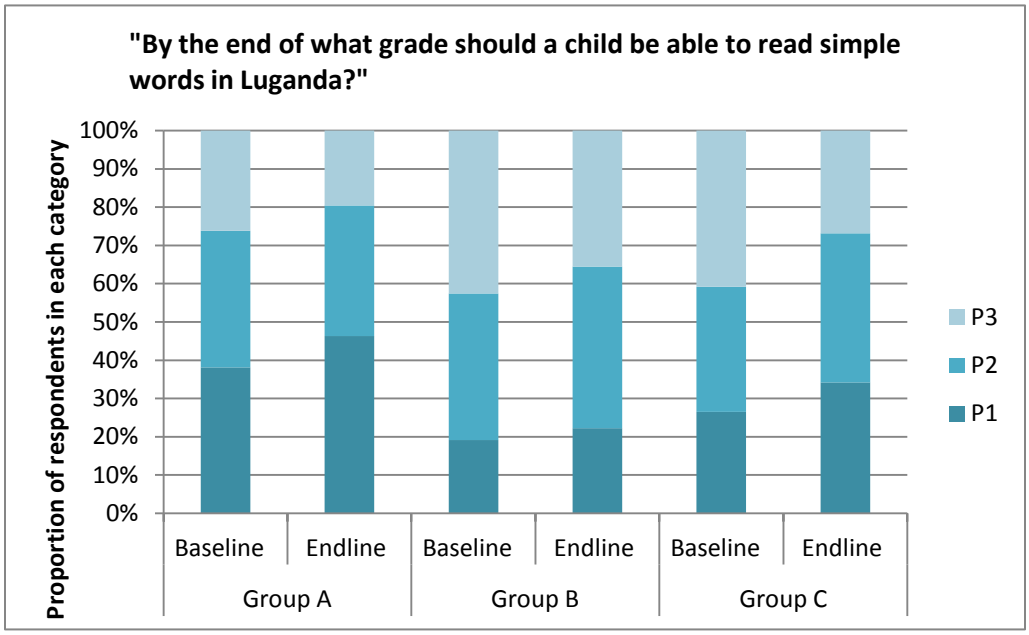
Does participation in a structured reading program change parents' attitudes and engagement in reading with their children?

Before and after participation in the program, parents were asked questions about attitudes and engagement in reading in general. This was partially to be able to control for the families who were already more active above and beyond the MLIT product when analyzing the changes in student learning. These questions were also meant to determine if participation in the short-term could have more long-term consequences by changing parents' attitudes towards reading. At baseline parents already overwhelmingly (98% in each group) supported the need to learn how to read in Luganda, and the majority believed that children should know how to read simple words in Luganda by P 2 or P3. At endline, there is a slight shift in all groups, with more parents believing that children should be able to read by P1 and fewer parents who believe this skill should not be

[8] See research on microlearning or spaced learning; for example, Douglas Fields, R. (2005). Making memories stick. *Scientific American,* or the experience of Text4Baby: https://www.text4baby.org

possible until P3 (see ***Figure 7***, below). This shift is not statistically significant for any of the groups.

Figure 7: The grade in which parents believe children should be able to read simple words in Luganda, baseline and endline



Significance testing: Group A: chi-square=3.2, p-value=0.78; Group B: chi-square=1.1, p-value=0.95; Group C: chi-square=4.2, p-value=0.52.

n=50 Group A, 52 (Group B), 53 (Group C)

At baseline and endline children and parents were asked whether, in the past school term, they had done certain literacy-promoting activities together, such as telling a story, teaching letters or words, reading aloud, or asking the child to read aloud. A total of 11 questions of this type were asked. A composite indicator was created based on the percent of affirmative responses to each question out of the total asked. This value was then used as an overall indication of parental support for literacy, and a comparison from baseline to endline can also suggest whether participation in the program changed the level of parental engagement. Although the value alone does not tell us which activities are being done, it does tell us whether more activities are being done. ***Table 4*** shows us the change in children's and parents' reports of literacy activities using this composite indicator.

As a reminder, the percent increase calculation shows how much larger the gains of the intervention groups were than the gains of the control group (if there were any gains in the control group).

Table 4: Parental engagement with children in literacy-promoting activities

	Index total			% increase	Effect size
	N	Baseline	Endline		
Children's responses					
Group A (Mobile)	54	4.7	6.6	17%	.31
Group B (Paper)	56	5.4	6.0	-9%	-.18
Group C (Control)	54	5.6	6.7		
Parents' responses					
Group A	54	4.8	9.3	97%	.51
Group B	56	5.0	5.6	17%	.31
Group C	54	4.8	4.7		

According to both parents and students, the level of engagement of parents in the literacy-promoting activities with their children increased the most for Group A. The difference is particularly notable in the parents' responses to the questions, where average number of activities that the parents engaged in nearly doubled, whereas it remained close to the same for Group B and C. The p-values associated with this change were greater than 0.05, but less than 0.1 (p=.1 for Group B and p=.06 for Group A), so could still be due largely to chance. Considering the large effect size, this is still evidence of a marginal increase in engagement of Group A.

Parents were also asked at endline whether they feel that after using MLIT they are better able to support their child's reading improvement. The overwhelming majority across all groups responded "yes." They also provided a reason why they feel they are now better able to help their child(ren); responses provided by parents were aligned with expected answers, where possible, by the assessor in order to provide a quantitative analysis of response types. If a matching response option was not available on the survey form, the assessor had the option of selecting "Other." Multiple responses were allowed. The response options with the highest frequencies by group were as follows.

- Group A: "It provided me with activities/games to do with my child" (68%) and "It helped me understand what is important about learning to read" (54%);
- Group B: "It provided me with activities/games to do with my child" (65%) and "It helped me understand what is important about learning to read" (21%); and "It showed me I can help my child outside of school" (29%).
- Group C: "It provided me with activities/games to do with my child" (42%) and "It showed me I can help my child outside of school" (50%).

These answers provide an indication that all parents value the opportunity to help their children improve their reading ability, and they are especially grateful to have specific,

concrete, activities to do with their children. The emphasis on 'concrete' activities is interpreted as such by the fact that only in groups A and B—those with some kind of reading content to do with their child—did a sizeable proportion of parents answer that they now understand what skills are important in learning how to read.

Summary. A similar conclusion can be reached from the data in this section as in the previous section—parents do want to help their children and appreciate any type of suggestions and support that they can get in doing so. Providing a daily supportive routine can help parents increase their engagement in reading activities at home. Since attitudes towards reading in the mother tongue were already positive across research groups before participation in the program, there was not necessarily significant room for a further positive change in attitudes due to the program. However, clearly the program did not discourage or develop *negative* attitudes towards reading, and it does seem that more parents now believe that children should be able to read much earlier than they did before. This effect was not different according to treatment group, though, so it is likely that simply participating in a program that targeted P1 reading helped parents reach the conclusion that it should be possible to learn to read in this grade.

Does this change affect the nature of their engagement (type of literacy activities they do)?

Table 4, above, provided a picture of parents' overall engagement with their children by summing the number of activities that they reported doing with their children. We can also look individually at each line item to see whether the nature of their engagement changed from baseline to endline. Keep in mind that the question asked was "In the past week have you….". At both baseline and endline, the week prior to data collection was when school was not in session, but even so the specific circumstances in parents' daily lives are no doubt different and so may not be directly comparable. But we can still consider the question an appropriate proxy for parental engagement. ***Table 5***, below, shows the changes in specific activities. A negative percent increase would indicate that the change was less than the change in the control group.

Table 5: Increase in parents' report of specific activities engaged in with the child at baseline and endline

Subtest	Percent of parents engaging in the activity		% increase (relative to the control group increase)	Effect size
	Baseline	Endline		
Told a story				
Group A (Mobile)	43%	58%	-20%	-0.18
Group B (Paper)	51%	72%	-6%	-0.06
Group C (Control)	47%	71%		
Asked your child to tell you a story				

Subtest	Percent of parents engaging in the activity		% increase (relative to the control group increase)	Effect size
	Baseline	Endline		
Group A	24%	56%	49%*	0.25
Group B	24%	66%	90%*	0.46
Group C	25%	46%		
Played word games or riddles				
Group A	47%	45%	-16%	-0.15
Group B	51%	54%	-4%	-0.04
Group C	55%	60%		
Taught letters				
Group A	75%	79%	17%	0.28
Group B	80%	88%	20% **	0.39
Group C	74%	65%		
Taught words				
Group A	73%	81%	25%**	0.39
Group B	65%	82%	40%**	0.57
Group C	64%	54%		
Taught songs				
Group A	47%	57%	-12%	-0.11
Group B	45%	42%	-43%*	-0.39
Group C	47%	63%		
Read aloud to your child				
Group A	33%	45%	3%	0.02
Group B	24%	50%	68%	0.35
Group C	25%	35%		
Asked your child to read aloud				
Group A	43%	60%	57%*	0.49
Group B	42%	62%	67%*	0.57
Group C	47%	39%		
Talked about school				
Group A	86%	85%	-11%	-0.29
Group B	87%	84%	-14%	-0.35
Group C	85%	93%		
Provided books or other reading materials				

Subtest	Percent of parents engaging in the activity		% increase (relative to the control group increase)	Effect size
	Baseline	Endline		
Group A	80%	85%	3%	0.05
Group B	80%	78%	-5%	-0.10
Group C	69%	72%		

n= 47 (Group A), 50 (Group B), 46 (Group C)
*** = p < 0.001; ** = p<.01; * = p<.05; P-levels shown indicate significant difference between change in intervention sample performance from baseline to endline, and change in control sample performance from baseline to endline.

The table above indicates that in most cases, engagement with children increased across all groups, but the increase was generally larger for groups A and B, and between these two intervention groups, percent increases and effect sizes were usually higher for group B. Some exceptions stand out:

- First, storytelling increased in all groups, but the size of the increase was largest for Group C (control group, asked only to engage with the child every day but not given any specific content for doing so).
- Similarly, playing word games and riddles or talking about school with the child increased the most in Group C, and either declined (Group B) or increased only slightly (Group A) in the other groups.
- Teaching songs also increased the most in Group C, and declined in Group B.
- The incidence of teaching letters and words actually went down for Group C, so one can wonder whether by asking parents to engage their children verbally, some explicit support for more traditionally written forms of literacy-building were neglected. However, other explanations are possible (for example, maybe their conception of 'teaching letters/words' somehow changed between baseline and endline, or simply their recollection of events was different) and this study did not gather enough information to be able to say with certainty either way.

Summary. From the information we have about the nature of parents' engagement in reading during the study period, it seems that the one-time suggestion to parents in Group C was effective in motivating parents to engage with their children in largely verbal (and indirect) types of literacy-promoting activities. However, the mobile and paper-based programs were more effective in motivating parents to do more direct literacy-promoting activities such as learning letters and words and reading stories. The effect is particularly notable for parents in Group B where the average percentage of parents who reported reading aloud to their child doubled. Similarly, the percentage of parents who asked their child to read aloud increased significantly in groups A and B, though it declined in Group C; we know that asking a child to read aloud is an important predictor of reading

improvement.[9] In Section 3.2 we will see how this activity correlates to reading ability in this sample.

3.2 Was MLIT-Uganda effective in improving early grade reading ability?

The EGRA instrument was used to measure early grade reading ability before the intervention and again after the intervention. Baseline data confirmed that there were no major differences in the skills or characteristics (i.e., socioeconomic status, or SES) of the children in any one group, and that all children had room for improvement in the skills being reinforced by the MLIT-Uganda content.[10]

Summary of scores across all subtests

Table 6, below, shows the percent increase and effect sizes for each group across all subtasks. As a reminder, the percent increase shows the degree to which the intervention groups' gain is greater or lesser than the gain of the control group. The effect size shows the magnitude of the gains (an effect size larger than .4 is generally worth noting), and a higher effect size is usually aligned with a lower p-value of statistical significance. A low p-value tells us that the observed result is not likely due to chance.

Scores for letter sound identification and non-word reading are the number of correct items read per minute, because these are timed subtests. Scores for syllable segmentation, familiar words, and listening comprehension are the number of correct items out of the total possible, because these are untimed subtests. In the case of syllable segmentation and familiar words, there were a total of 10 items. For listening comprehension, there were a total of three questions.

Table 6: Endline gains across subtests

Subtest	Actual Scores (means)		% increase	Effect size
	Baseline	Endline		
Letter sound identification				
Group A (Mobile)	5.2	6.0	18%	0.16
Group B (Paper)	4.9	6.2	28%	0.22
Group C (Control)	4.2	4.0		
Nonword decoding				
Group A	3.2	3.7	0%	0.00
Group B	2.2	3.8	42%	0.15

[9] See Duursma, E., Augustyn, M., and Zuckerman, B. (2008). Reading aloud to children: The evidence. *Arch Dis Child*, 93:7.

[10] Note that the baseline numbers reported in the present report may not match the numbers presented in the baseline report due to some sample attrition. All baseline and endline figures presented in this report are only for the final sample of matched pairs (student and parent) for which baseline and endline data exist.

Subtest	Actual Scores (means)		% increase	Effect size
	Baseline	Endline		
Group C	1.7	2.3		
Syllable segmentation				
Group A	4.1	4.0	-30%	-0.01
Group B	3.4	4.5	-1%	-0.29
Group C	3.4	4.5		
Familiar word reading				
Group A	1.7	3.1	55%	0.34*
Group B	1.4	2.9	69%	0.31*
Group C	1.1	1.6		
Listening comprehension: Percent of correct answers out of three possible				
Group A	42%	47%	29%	0.35*
Group B	41%	54%	48%	0.58***
Group C	49%	42%		

The table above shows that actual gains were quite small across all groups. However, both intervention groups showed larger gains than the control group in all cases except syllable segmentation and non-word decoding. For nonword decoding, only Group B showed a sizeable average gain relative to the control group. For syllable segmentation, both A and B groups showed a negative gain relative to the control group (in other words, the raw score increased as much in the control group as it did in Group B and more than in Group A).[11] The largest actual gains were in the familiar word reading subtask. This is not surprising because this subtask used 10 words that were the key words of the MLIT-Uganda program in both the mobile and paper form. Any child who had completed the program should have seen or heard these words during the intervention period. The other subtasks measure skills less directly related to the MLIT content[12] and instead are general measures of reading and language processing ability.

Between the two intervention groups, the children receiving the MLIT paper program (Group B) tended to outperform the children receiving the mobile program (Group A).

[11] The figure in Table 8 is the average number of words for which *all* syllables were segmented correctly. However, when we calculate the number of words where children segmented *some* of the syllables correctly, the A group showed the largest gains—an 80% increase relative to the control group and effect size of .691.

[12] Note that the letter sounds subtask is directly related to the MLIT content; however, because of a difference in the way the assessors counted a correct letter sound and the way the MLIT audio program actually pronounced the letter sound, this subtask may not accurately reflect skills the child might have learned from the program (see Limitations).

Most of the effect sizes were moderate to low. The highest effect size was in the listening comprehension subtask (.58 for Group B). On this task, the absolute mean score of the control group declined from baseline to endline; Although the absolute gain in the mean percentage of correct comprehension questions for groups A and B was very small, the percent increase and effect sizes were large compared to the control group for this reason.

Interestingly, when we re-calculate the fluency subtasks without including zero scores—so, in other words, calculating the mean only for children who showed some reading ability—some of the percent increases in scores from baseline to endline are actually negative. A negative percent increase tells us that the gain for that group was less than the gain for the control group. However, for Group B non-word reading the percent increase is 45% and the effect size large (.563) and for familiar word reading, both Group A and Group B increased between 10% and 20% above the control group. However, the sample size remaining for both of these tasks is very small, so these data need to be interpreted with caution. See ***Table 7***.

Table 7: Endline gains for fluency subtests with zero scores removed

Subtest	N	Actual Scores (means)		% increase	Effect Size
		Baseline	Endline		
Letter sound identification (correct letters per minute)					
Group A (Mobile)	28	9.7	8.7	-14%	-0.25
Group B (Paper)	30	9.1	8.5	-11%	-0.15
Group C (Control)	33	6.8	7.3		
Nonword decoding (correct words per minute)					
Group A	12	13.7	11.2	-5%	-0.09
Group B	11	11.2	14.1	42%	0.56
Group C	7	12.9	11.1		
Syllable segmentation (number of words with all syllables correctly segmented out of 10)					
Group A	30	7.4	6.9	-21%	-0.49
Group B	28	6.9	7.0	-13%	-0.28
Group C	28	6.5	7.5		
Familiar word reading (percent of words read correctly out of 10 total)					
Group A	20	4.6	5.6	10%	0.14
Group B	18	4.5	5.9	18%	0.25
Group C	14	4.1	4.7		
Listening comprehension (percent of questions answered correctly out of three total)					
Group A	38	57%	63%	2%	0.04
Group B	43	53%	69%	20%	0.47
Group C	43	61%	67%		

Because the means scores in ***Tables 6*** and ***7*** above are quite low, and they also mask differences at the extremes, we can look at the difference in zero scores as an indicator of improved skills among those who began with the least observable reading ability.

Change in zero scores across subtests

When a child does not give a single correct response to the items in a subtest, it results in a zero score for that subtest. A response is counted incorrect if the child says a wrong answer or if the child doesn't say anything at all; therefore we can't be sure whether the zero score is due to an inability to answer the question correctly or an unwillingness to do so. For this analysis, a decrease in zero scores is a good indication of improved ability, and a negative change (and thus negative percent increase and negative effect size) is desirable because we want to see fewer children with zero scores. A positive percent increase—as in the case of syllable segmentation—actually means that the size of the decrease in the mean percentage of students with a zero score was not as large as it was for the control group. ***Table 8*** shows the change in the percent of zero scores.

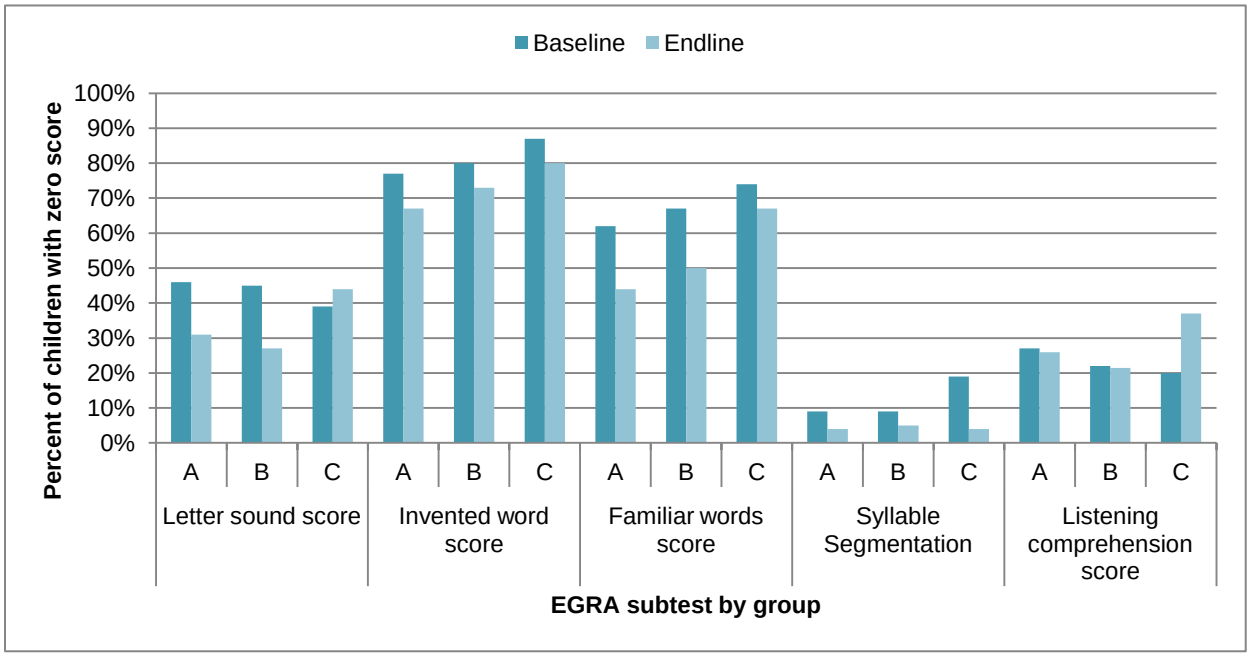
Table 8: Change in the percent of zero scores from baseline to endline

Subtest	Percent zero scores			
	Baseline	Endline	% increase	Effect size
Letter sound identification				
Group A (Mobile)	46%	31%	-44%**	-.41
Group B (Paper)	45%	27%	-53%***	-.50
Group C (Control)	39%	44%		
Nonword decoding				
Group A	77%	67%	-4%	-.07
Group B	80%	73%	1%	.02
Group C	87%	80%		
Syllable segmentation				
Group A	9%	4%	100%*	.33
Group B	9%	5%	126%**	.40
Group C	19%	4%		
Familiar word reading				
Group A	62%	44%	-16%	-.20
Group B	67%	50%	-15%	-.21
Group C	74%	67%		
Listening comprehension				
Group A	27%	26%	-66%**	-.40
Group B	22%	21%	-78%**	-.39
Group C	20%	37%		

In all cases, the percentage of zero scores in the intervention groups A and B declined. This change is particularly notable for the letter sound identification subtask, where after the intervention, there were about 40% fewer children in Group B who could not give one single correct response, and 32% fewer in Group A. Compared to Group C, where the percentage of children with a zero score actually increased, this represents a sizeable effect that is most likely attributable to the intervention. Across subtests, the zero scores also declined for the control group, though usually by a lesser margin, except for letter sound identification and listening comprehension, where the percentage of zero scores increased. For syllable segmentation, the percentage of zero scores decreased by a larger margin in Group C because there were many more zero scores at baseline; at endline, the actual percentage of zero scores across all groups was nearly equivalent.

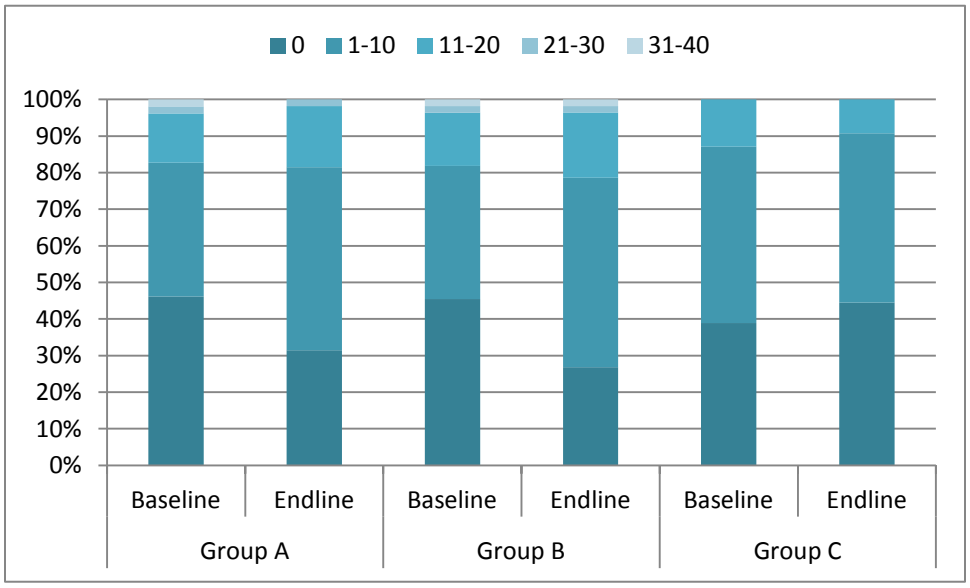
Figure 8 shows the same information in graph format.

Figure 8: Zero scores by subtest at baseline and endline for all groups



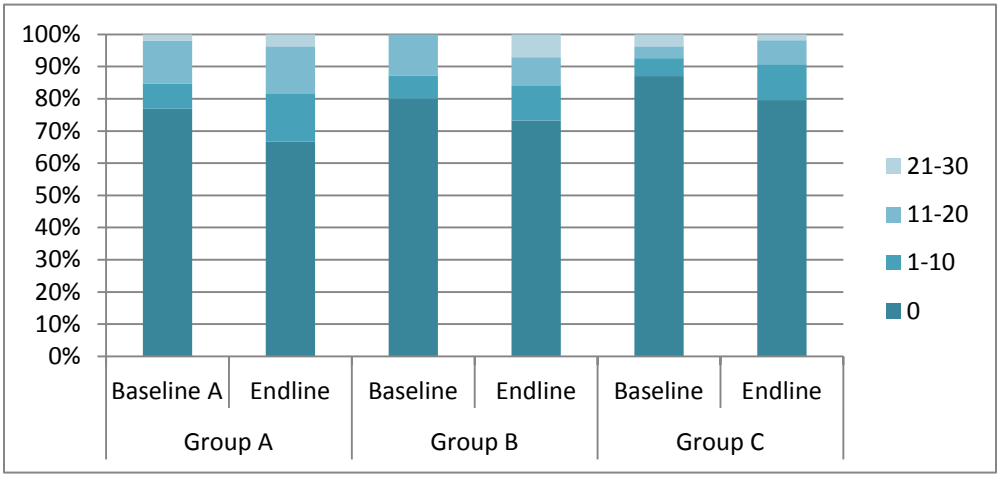
It follows that if there are fewer children with zero scores in the group, then there should be an increase in scores at higher ranges. Looking at the distribution of scores can provide more information than only looking at the means across the group. In the case of letter sounds, the distribution of scores from baseline to endline does show a shift from fewer children in the range "0" to more children in the range "1-10 correct letter sounds per minute" (see ***Figure 9***), and slightly more children in the range of "11-20" correct letters per minute for the A and B groups. This trend is reversed for Group C, where there are more children in the "0" correct letters per minute group and fewer in the ranges "1-10" and "11-20".

Figure 9: Letter sound identification scores by range, baseline and endline



Similarly, for nonword decoding, although the change in the average score was the largest for Group B (from 11.2 cnonwpm at baseline to 14.1 cnonwpm at endline with zero scores removed, or from 2.2 cnonwpm at baseline to 3.8 cnonwpm at baseline including zero scores), we also see that more children in Group A 'moved out' of the zero scores and into a measurable score range than in Group B. Whereas the profile of groups A and B were very similar at baseline (see ***Figure 10***, below), one-third of children in Group A are now reading non-words with some measurable ability, but this is less than one-fourth of the children in Group B. However, the higher mean score for Group B on the nonwords task is due to the fact that there are more children in this group within the highest range of ability—21 to 30 cnonwpm—when there were actually none in that range before the program.

Figure 10: Nonword decoding distribution of scores by range, at baseline and endline by group



Summary. Taken together, the various types of analyses presented in this section show a similar trend—the intervention groups showed greater overall improvement than the control group, and the group that received MLIT on paper generally showed greater improvement than the group that received MLIT by phone. However, the actual gains remain quite small and therefore the difference between Group A and Group B is negligible. This difference between the intervention groups and the control group suggests that the changes were due to the intervention, but in order to more definitively link changes in outcomes to interaction with program materials, more analysis is needed. As mentioned in Section 1.2 (Baseline findings), we determined that although there were some differences in the characteristics of the research groups (gender composition and SES), these factors were not associated with scores among the entire sample. This gives us increased confidence that the gains observed in groups A and B were due to the MLIT materials. Yet, as presented in Section 3.1 (Was MLIT-Uganda effective in improving parental support for literacy?), above, it is possible that only about 40% of the children actually engaged in the program at all, and some children no doubt participated with more intensity than others. The next step in analysis is to see what level of use of the materials is linked to outcomes, and if it was only the children who were using the program who are responsible for the mean increases in scores, or if the increases were found across children with different characteristics and levels of participation.

What factors may be associated with outcomes?

Linear regression was used to determine whether certain characteristics are associated with reading performance independently of the child's level of participation in the program. Tests were done against demographic characteristics (i.e., SES) and characteristics of participation. These results are described next.

Participation in the program. As described above, in each research group there were parents/students who participated with more intensity than others, and some who may not have participated at all. Although we can not know with exactly what quality and frequency parents engaged their children in the MLIT activities, we have self-reports as measures of participation that can help to distinguish whether the gains in reading ability reported above are actually due to use of the MLIT content or if they might have been a result of other factors.

When analysis of variance (ANOVA) was applied to questions parents answered about participation, several responses stood out as having a significant positive correlation with reading scores, as measured by the nonword reading and familiar word reading subtasks (see ***Table 9***, below). Since none of these questions showed any significant correlation with the other subtasks, they haven't been presented. Given some of the limitations with the letter sound measurement (see Limitations section) and the more indirect nature of the listening comprehension and syllable segmentation subtasks, these two subtests—nonword reading and familiar word reading—are considered the best overall indication of actual reading ability. In this case, a small p-value (indicated by one or more *) indicates

an association between the student score and the question. The beta indicates "direction." A positive beta indicates that if the respondent answered "yes", it has a positive outcome. There is a strong association between student scores on nonword reading ability and the parents' reporting that they usually did all of the activities that the lesson suggested, and there is a trend (p=<0.1) in this direction for familiar word reading. For the latter subtask, the association is stronger for students whose parent said that they had repeated a lesson. However, since the r-squared[13] values are small, there must be other factors that also contribute to the change in the student score. This is to be expected.

Table 9: Linear regression: effect of participation (x) on nonword reading ability

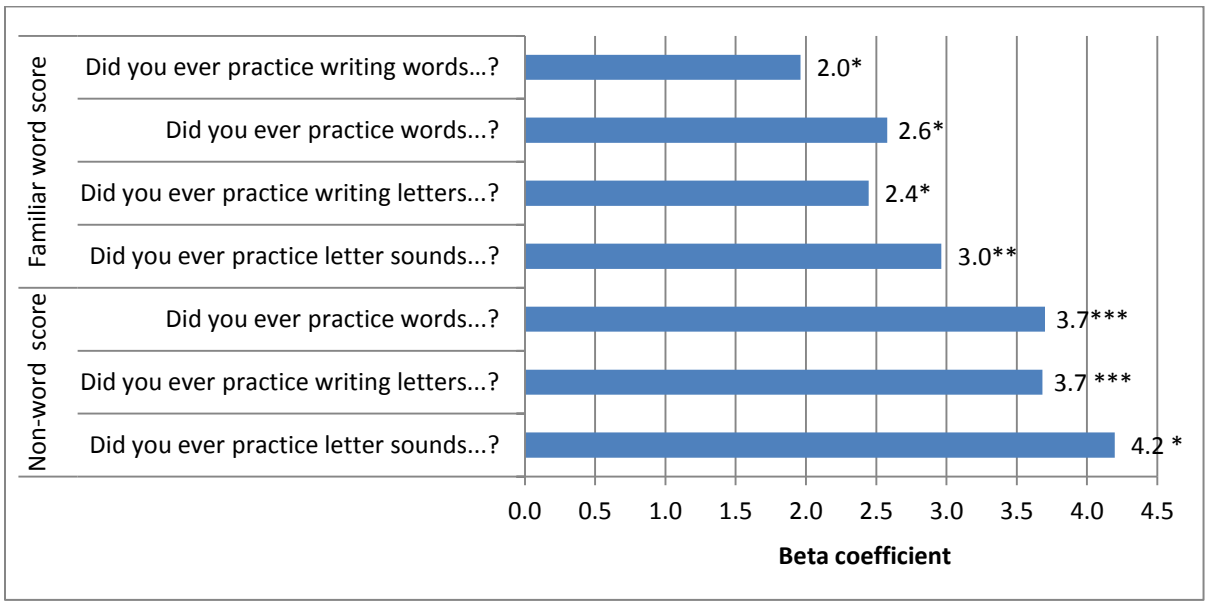
Question	N	Beta Coefficient	r^2	F-score	p-value
Nonword reading ability					
Did you do every lesson (or did you do an activity every day)?	126	na	0.053	2.3	0.084
Did you usually do all of the activities that the lesson suggested?	119	na	0.114	7.5	0.001***
Did you ever repeat a lesson you had already done? [1]	92	1.95	0.016	1.5	0.231
Familiar word reading ability					
Did you do every lesson (or did you do an activity every day)?	126	na	0.049	2.1	0.105
Did you usually do all of the activities that the lesson suggested?	119	na	0.040	2.4	0.096
Did you ever repeat a lesson you had already done? [1]	92	1.96	0.063	6.0	0.016*

[1] Not asked of the control group
na: single coefficient unavailable when predictor is greater than 2 possible responses.
*** = p < 0.001; ** = p<.01; * = p<.05; P-levels shown indicate significant difference between change in intervention sample performance from baseline to endline, and change in control sample performance from baseline to endline.

There were also some correlations with the student-reported participation measures. These are presented in ***Figure 11***, below, although the method of analysis was the same as for parents. Each bar shows the size of the beta coefficient, and can be interpreted as "A child who answered 'yes' to the question 'Did you ever practice writing words from lessons in this book/phone?' read two more correct familiar words than a child who answered 'no'." As above, the asterisk indicates the significance of the p-value. In the case of student reported measures, the r-squared values were all below 0.1.

[13] R-squared values indicate the variance in the student score that can be explained by the variance in the question.

Figure 11: Student reported measures of participation (effect on familiar and nonword scores)



n=109 (Group A and B sample only—questions not asked of the control group).
*** = p < 0.001; ** = p<.01; * = p<.05; P-levels shown indicate significant difference between change in intervention sample score from baseline to endline, and change in control sample score from baseline to endline.

For both parent and student-reported measures of participation on student scores, we can see a positive association is present, but because of the low r-squared value, we cannot use these questions to predict student scores. Nevertheless, this lends credibility to the evidence that interaction with the MLIT materials led to improvements in the student scores (which were not seen in the control group scores).

Reading aloud. As described above (***Table 5***), one of the key differences in participation noted between the intervention and control groups was a much larger increase in the frequency with which parents read out loud to their children. Could this have been associated with the improved scores seen in the students in these groups, and furthermore, could this explain the slightly higher scores of the B group (who were given print materials)? To answer this question, we calculated the differences in student scores on non-word reading and letter sound identification subtasks according to whether the parent answered "yes" or "no" to the questions "In the past week, have you asked your child to read aloud to you?" and "In the past week, have you read aloud to your child?" ***Table 10*** shows that, with few exceptions, the children of parents who answered "yes" at endline already had higher scores at baseline than the students whose parents answered "no" at endline. Although the mean scores of the "yes" group on these subtasks were usually slightly higher after the program period than the mean scores of children whose parents answered "no", the percent increases were much higher due to the starting scores, in most cases the control group showed just as much of an increase from baseline to endline when the parent answered "yes". None of the changes are statistically significant unless annotated.

Table 10: Effect of reading aloud (parent-reported) on letter sound identification and nonword reading skills

Subtest Group and response to question			Mean score (items per minute)		% increase	Effect size (across group)
			Baseline	Endline		
"In the last week, have you asked your child to read aloud to you?"						
Letter sound identification						
Group A (Mobile)	YES	(n=28)	6.0	6.9	-2%	-.03
	NO	(n=19)	5.0	4.6	9%	.07
Group B (Paper)	YES	(n=31)	5.9	6.7	-5%	-.05
	NO	(n=19)	3.8	6.1	80%	.46
Group C (Control)	YES	(n=18)	3.6	4.7		
	NO	(n=28)	4.9	4.0		
Non-word decoding						
Group A	YES	(n=28)	5.8	4.8	-28%	-.23
	NO	(n=19)	1.4	3.5	74%	.18
Group B	YES	(n=31)	3.8	4.1	-10%	-.06
	NO	(n=19)	0.7	3.0	162%	.20
Group C	YES	(n=18)	1.7	2.4		
	NO	(n=28)	1.7	2.8		
"In the past week, have you read aloud to your child?"						
Letter sound identification						
Group A	YES	(n=21)	7.3	7.9	4%	0.04
	NO	(n=26)	4.5	4.5	3%	0.02
Group B	YES	(n=25)	3.7	5.2	32%	0.24
	NO	(n=25)	5.0	7.8	57% ~	0.41
Group C	YES	(n=16)	4.5	4.8		
	NO	(n=30)	4.2	4.0		
Non-word decoding						
Group A	YES	(n=21)	6.6	3.9	-55%	-0.60
	NO	(n=26)	1.8	4.6	89%	0.24
Group B	YES	(n=25)	1.6	3.0	26%	0.09
	NO	(n=25)	2.2	4.4	47%	0.16
Group C	YES	(n=16)	0.4	1.3		
	NO	(n=30)	2.1	3.4		

~ $p<0.1$

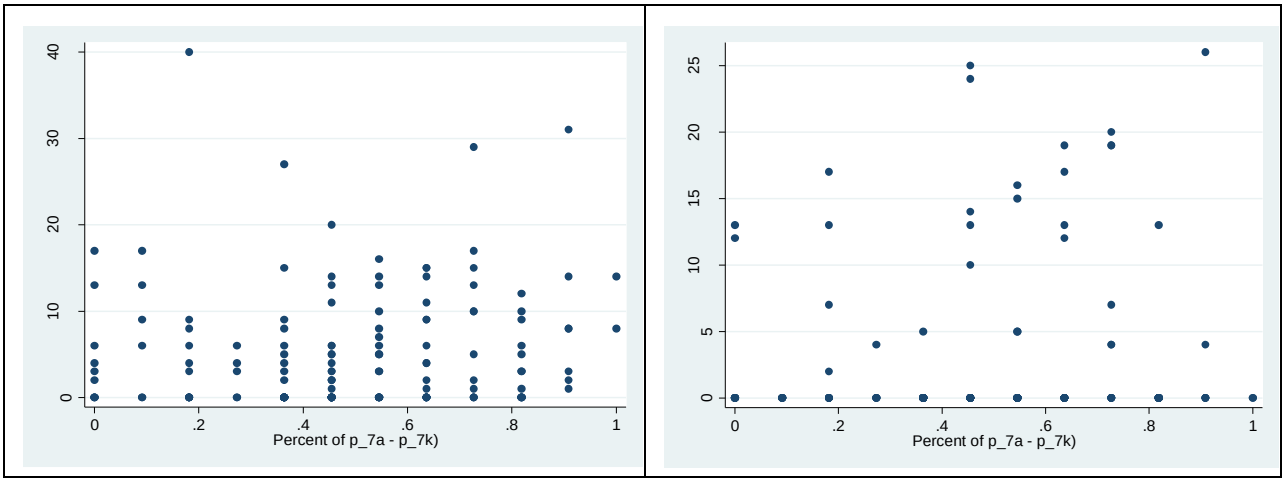
This could indicate two things:

1. There are other factors besides reading aloud or being read aloud to that are responsible for the gains in students scores; and
2. The MLIT content in both mobile and paper formats is successful in provoking large gains among the students who are most in need of it—those with the lowest starting abilities—even in the absence of regular oral reading activities at home.

As a reminder, the question was phrased as "In the last week…", so a "no" response doesn't necessarily indicate that this activity never takes place in the home; it could just be that there were extenuating circumstances the week prior. Nevertheless, it is generally accepted as a reliable proxy for parental engagement.

If oral reading activities alone were not responsible for the gains, then intuition might suggest that it is a combination of literacy-promoting activities that is responsible for the higher mean increases shown in Groups A and B. In ***Table 4***, above (Parental engagement with children in literacy-promoting activities), we saw that there were large increases in the total number of activities that parents reported engaging in with their children after the research period. ***Table 5*** (Increase in parents' report of specific activities engaged in with the child at baseline and endline) listed the different types of activities that parents were asked about. Below, in ***Figure 12***, we see how the parents' answers are associated with student outcomes. The horizontal axis is the percentage of activities (out of 11 possible) to which the parent responded "Yes, [I did this with my child in the last week]." The vertical axis is the child's score on each subtask, in number of correct items per minute.

Figure 12: Association between total parent engagement and student outcomes



These analyses show that across the entire sample there is no correlation between the total number of activities that parents engaged in and the students' scores. Several possible interpretations for this are:

1. Parents are not honest/accurate in reporting the activities that they did with their children.
2. Limiting the report to "in the past week" is not reliable.
3. These activities are only loosely associated with the MLIT content/methods and therefore are not the things that are having the most effect on the student score increases.

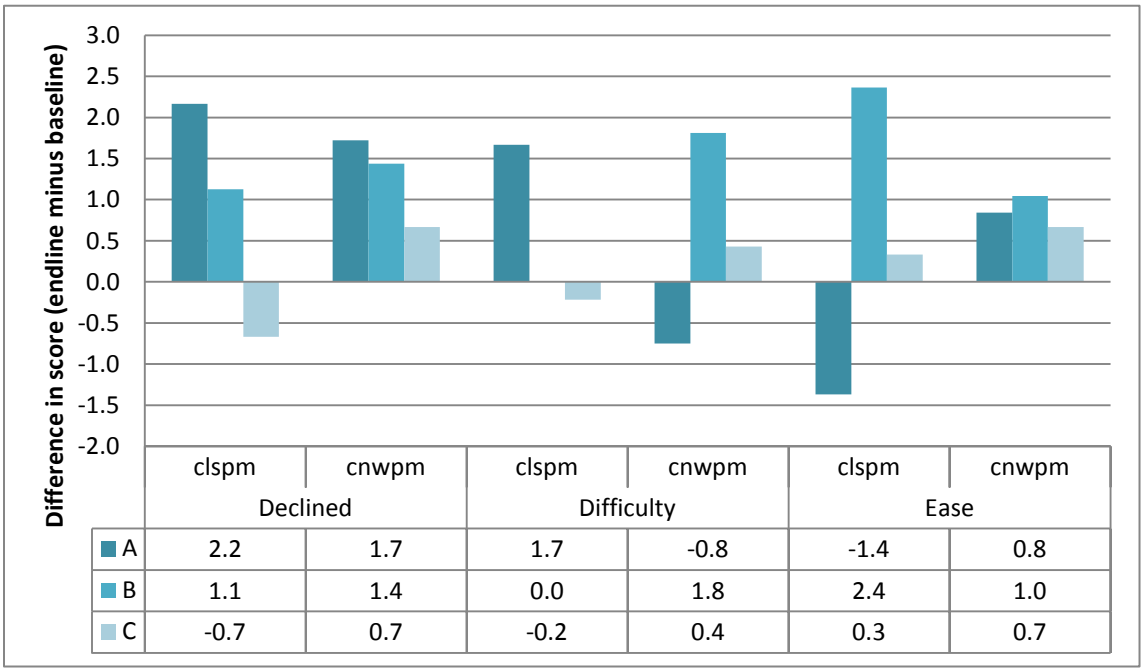
Socioeconomic status. At baseline, all parents answered a series of questions about household possessions, employment status, and family size. Together the answers to these questions can be used to estimate level of wealth (SES) as a single indicator that can be used in regression models. At baseline, analysis of this indicator showed that families in all three groups have a similar SES profile. The questions were not repeated at endline, as it is assumed that there would not be a major change in SES from baseline to endline, but the SES value from baseline was used in the analysis of endline scores. Several tests were performed, and in each case a large p value (>0.8) indicates that there is no evidence that SES is influencing student score improvement on correct letter sounds per minute and correct nonwords per minute.

School factors. The sampling framework—selecting students from the research and control groups from within the same school—was intended to avoid confounding effects of school factors on any one group. As confirmation that the sampling was effective, the mean score and the score difference from baseline to endline for the non-word reading subtask of each school was compared with that of every other school and there were no significant p-values. Therefore, although some schools had higher mean scores than the others (the highest being 2.3 and the lowest being 0.06) this is most likely due to chance and not a substantial difference between the schools.

Gender. Analysis was also performed to see whether gender could have had an effect on mean differences between the research groups. This was important since there was a large difference in the composition of the groups at endline—Group C having proportionally more girls, and Group A having proportionally more boys. The only significant difference found was for the decrease in zero scores for girls on the familiar word reading subtask.

Parents' education level and reading ability. A key assumption in providing paper-based materials was that parents had to be literate to be able to use them; also, the SMS+audio format of MLIT-mobile is to counteract parents' low education and literacy levels. We checked whether the large gains shown by the students in groups A and B could be associated with parental background rather than interaction with the MLIT materials. No correlation was found between parents' observed reading ability ("Declined to read", "Read with difficulty", "Read with ease"), their reported level of education (highest grade completed), and change in correct letter sounds per minute and correct nonwords per minute (***Figure 13***).

Figure 13: The effect of parent education background and change in student scores



	clspm	cnwpm	clspm	cnwpm	clspm	cnwpm
	Declined		Difficulty		Ease	
A	2.2	1.7	1.7	-0.8	-1.4	0.8
B	1.1	1.4	0.0	1.8	2.4	1.0
C	-0.7	0.7	-0.2	0.4	0.3	0.7

Finally, we checked the characteristics of the children with the highest baseline to endline gains on correct non-words per minute. ***Table 11*** is a profile of the top approximately 40% of students—those with a gain of more than 6 correct nonwords per minute. 12 of these students come from Group A, 8 from Group B, and 5 from Group C. Once again, nothing stood out as statistically significant about this subsample, though the size of the sample is very small to have an effect on p-values. The characteristics show that children are in the average range of SES (same range as the entire sample at baseline); the parents demonstrate some literacy ability in both English and Luganda, and both students and parents report engaging in an average of 5 literacy-promoting activities in the past week. A small majority of these highest-performing students were girls, and they reported reading out loud to their parents the week before the interview.

Table 11: Characteristics of the students with highest change in nonword reading score

subtest	N	Result	SE	SD	P-value
Average age	22	8.0	0.38	1.77	1.000
Proportion female	22	59%	0.11	0.50	0.702
SES Index (scale of 1 to 100, from poorest to wealthiest)	24	49.9	2.08	10.17	0.390
Proportion of literacy-promoting activities that the parent did with the child in the last week	25	51%	0.05	0.24	0.596
Parent's English oral reading fluency at	25	29.3	6.32	31.62	0.363

subtest	N	Result	SE	SD	P-value
baseline (cwpm)					
Parent's Luganda oral reading fluency at baseline (cwpm)	25	26.9	4.88	24.38	0.443
Student reported number of literacy-promoting activities that the parent engaged with them in last week	25	5.3	0.59	2.94	0.919
Proportion of parents who read aloud to their children last week	24	33%	0.10	0.48	0.483
Proportion of parents who asked their children to read aloud to them last week.	24	58%	0.10	0.50	0.132

Summary. To conclude, we have evidence that use of the MLIT-mobile and MLIT-paper results in slightly larger improvements in measures of early reading skills than children who did not use the materials. However, the instruments used, and particularly the sample size of the study, do not allow us to isolate exactly what aspect of the program or what type of parental involvement was most powerful. We can be relatively certain, though, that the changes were due to the program and not to other factors such as home and school environment, or SES. The opportunity to engage with a parent on a regular basis using specific content had a marked improvement on early literacy skills, especially for children who needed it the most—those with little to no demonstrated reading ability at baseline. However, the actual gains do not necessarily reflect the extent of the MLIT content—all letters of the alphabet and 10 key words. Note, however, that there were some limitations to the quality of the content as it was produced. The next section will look at how the MLIT materials were used, what worked, and what didn't.

3.3 What aspects of the MLIT product were most successful?

Looking at the characteristics of the MLIT content and implementation that were successful, and those that might have been problematic, can help us answer the final research question: What are the contextual prerequisites necessary to implement the program? Or in other words, what can be improved upon and taken into consideration in future programs? This will help formulate the recommendations for Phase 2 of this grant and other future implementations. This section will look at some of the evidence from student and parent questionnaires that provide responses about the mobile-phone product, in particular, but also the paper version, where relevant.

Some of the information already described above has provided some important contextual evidence that:

- Parents value the opportunity to have clear and simple content that they can use to help their children at home;

- Children enjoy doing simple, daily supplementary activities at home, especially storytelling; and
- Sisters and brothers often become involved in such programs, both as facilitators and as learners.

While these findings are applicable to both the mobile and paper versions of the product, the evidence also points to a slight advantage gained from the paper version of the program rather than the mobile (SMS+audio) version. Looking at some of the feedback from parents in these groups can help us understand what factors enable or hinder parents from fully participating in the program or from adopting the mobile format.

Parent dropout and substitution

As noted in the sample section above, there were some parents who were replaced by another parent for the endline interview. The number of cases was very small (7 total, split between groups B and C), and it is not possible to draw any conclusions from the data gathered about why they were substituted; interviewers did not systematically gather information about why a different participant was sent. However, it doesn't appear to be consistently related to gender or education level or reading ability. For example, of the four parents in the paper group who were substituted by another parent at endline, two of them read in Luganda with demonstrated ease, according to assessors, while the other two declined to read or read with difficulty. Similarly, while one of the parents had never been to school, the other three had completed primary school. Thus the reasons for substitution remain highly personal and not generalizable; what is important is that when parents felt they could not do the activities for whatever reason, they found a substitute.

This conclusion is further supported by another question in the parent survey. All parents—whether the same parent or a different one than at baseline—were asked "Did anyone else ever do the activities with your child". ***Table 12*** shows select characteristics of parents who answered "Yes" to this question, based the hypothesis that reading ability or personal availability might be cause for nonparticipation in the program.

Table 12: Characteristics of parents who sometimes had other adults conduct the program for the child

Group	Number who answered "Yes"	Read with difficulty or declined to read		Occupation is "agriculture/farming"	
		Proportion of those who answered "Yes" at endline	Proportion of total group sample at baseline	Proportion of those who answered "Yes" at endline	Proportion of total group sample at baseline
Group A (Mobile)	18	72%	58%	50%	47%
Group B (Paper)	12	58%	58%	50%	38%
Group C (Control)	24	75%	61%	29%	32%

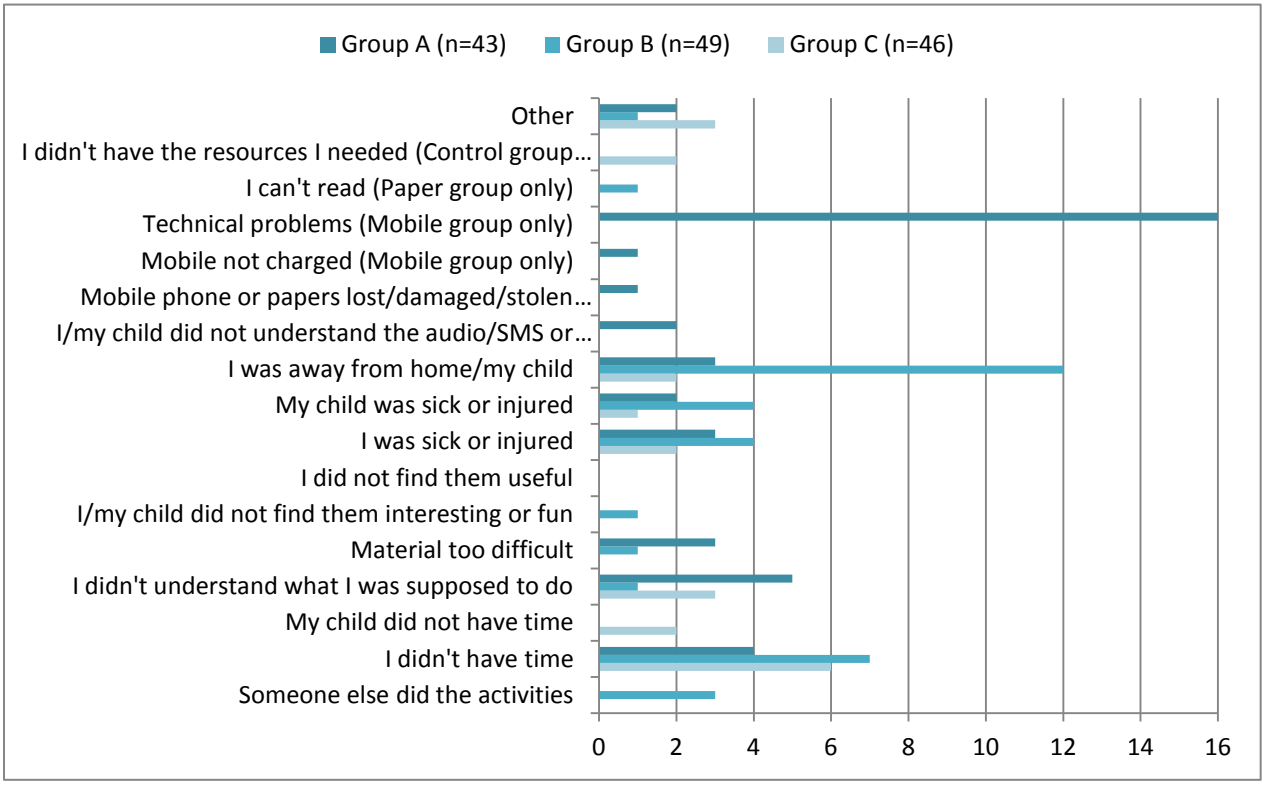
Again, the characteristics within the groups vary, and there is no conclusive evidence here that reading ability or occupation were the reasons parents sometimes had someone else do the activities with their children. For example, 72% of parents in Group A who demonstrated no or poor reading ability sometimes had another person do the activities with their child; this proportion is slightly higher than among the entire sample, where 58% of all Group A parents demonstrated low reading ability. We can also analyze the data from the other point of view, sorting by parents in Group B—the paper group, which required reading ability in order to conduct the lessons—who demonstrated low reading ability. In this case we still find that many parents who said they could read still had someone else do the activities with their child, and vice versa (some who said they could not read *did not* have someone else help them).

Factors that prevent parents from engaging in the activities

In fact, the most common reason parents in Group B said they did not do the activities on some days was because they were away from home or otherwise away from the child (e.g., the child might have been staying with a relative during the school term break). On the other hand, the main reason parents in Group A said that they did not do the activities every day is technical problems. This is not surprising as there were known technical problems with lesson delivery (see Limitations).

Figure 14 shows the proportion of responses to the question "If there were days when you did not do the activities with your child, please tell me why" for all groups.

Figure 14: Reasons cited by parents for not doing the activities every day



It is interesting that the incidence of "I was away from home or my child" was much larger in Group B than the others, but there is no reason to believe this is linked to the format of the program. All groups had the constraint of finding enough time to do the activities. Other reasons cited by parents include being too tired, losing one's glasses, thinking the program had been abandoned, or waiting for exercises to write in the book.

The information for parents who, at endline, admitted never doing any of the activities (and were considered "drop outs" for the purposes of the endline interview) provides a bit more detail on specific barriers to participation, particularly for Group A. The reasons given were:

- **Group A**: "Parent had lost SD card, all messages had been deleted, none downloaded"; "The phone never worked"(e.g., SIM card not activated); "Never received any lessons"; "Parent lost eyesight and could not use the phone, referred child to another parent to do the lessons"; "Parent did not download any lessons; sound failed"; "Never did any lessons because the phone wasn't activated—probably the SD card was stolen."
- **Group B**: "Gave the booklet to someone else and didn't participate with the child" (no other reason given); Never did any lessons; book left at home (no other reason given)
- **Group C**: "Child had sight problem and was bedridden"

Although the program coordinators checked each phone for the last lesson downloaded, in addition to asking parents "What was the last lesson you did with your child?", this is no guarantee that they listened to the lessons if they were downloaded. There were also cases where the data could not be retrieved if the phone was out of battery power at the time of the interview. Only three phones were not returned at the end of data collection, and the interviews only uncovered two instances of phone breakage or loss[14].

Thus technical problems with phone functionality turned out to be more of a barrier than anticipated, given the previous assumptions of the program based on the high mobile phone penetration and use. Since the SMS+audio program involved more than just receiving or making a phone call or receiving an SMS (the activities that parents most often engaged in, according to baseline data), this proved to be a barrier for some parents. Furthermore, the phones required a data plan and internet connection in order to download the messages, so this added an additional level of complexity and a source of failure on the part of the network service provider. On the other hand, power for charging the phones was not a barrier, and although many parents used the solar charger, they also often used an electricity outlet at home or outside of home as well.

[14] Waiting for final inventory from local program coordinators.

Training and problem solving

Some of these reasons indicate a lack of understanding of what they were meant to do, particularly for Groups C and A. All participating parents had an orientation on the day they were assigned to the group, after baseline data collection. During this orientation parents were given instructions for downloading and listening to messages, for using the paper program, or the verbal advice (in the form of the list of literacy-promoting activities in ***Table 5*** above). Parents in the mobile program were also provided with one follow up meeting to answer technical questions. Parents in any program were allowed to contact the Mango Tree program coordinators with questions about the program or content at any time. According to records kept by Mango Tree, there were 16 calls between June and August from parents in Group A, from 12 unique participants. In most cases, the issue was that the individual was not receiving messages or they had forgotten the procedure for downloading the lessons. In some cases, these issues were a known problem with the network or service provider; at other times it required deleting the messages to create space for new ones. According to parents themselves, parents in each group had some contact with the program coordinators between the baseline and endline interviews. This is partially expected, since they would have had at least one meeting for the training, and at least two phone calls to schedule the dates of the meeting and endline data collection. However, some parents in Group A reported speaking with the program from 8 to 20 times. Only 2 parents in Groups B and C mentioned having contact with the program coordinators more than 3 times.

When asked whether they felt prepared to conduct the activities with the training they received, most parents answered positively. The responses were split nearly equally between the two degrees of "Somewhat" and "Very well" prepared, but only in Group B does the proportion of "Very well" outweigh the proportion of "Somewhat". The specific breakdown of responses for all groups is found in Table x, below.

Table 13: Parents' perceived readiness after program orientation

Degree of readiness	Group A	Group B	Group C
Not at all prepared	1	0	1
Somewhat prepared	24	21	24
Very well prepared	20	29	22

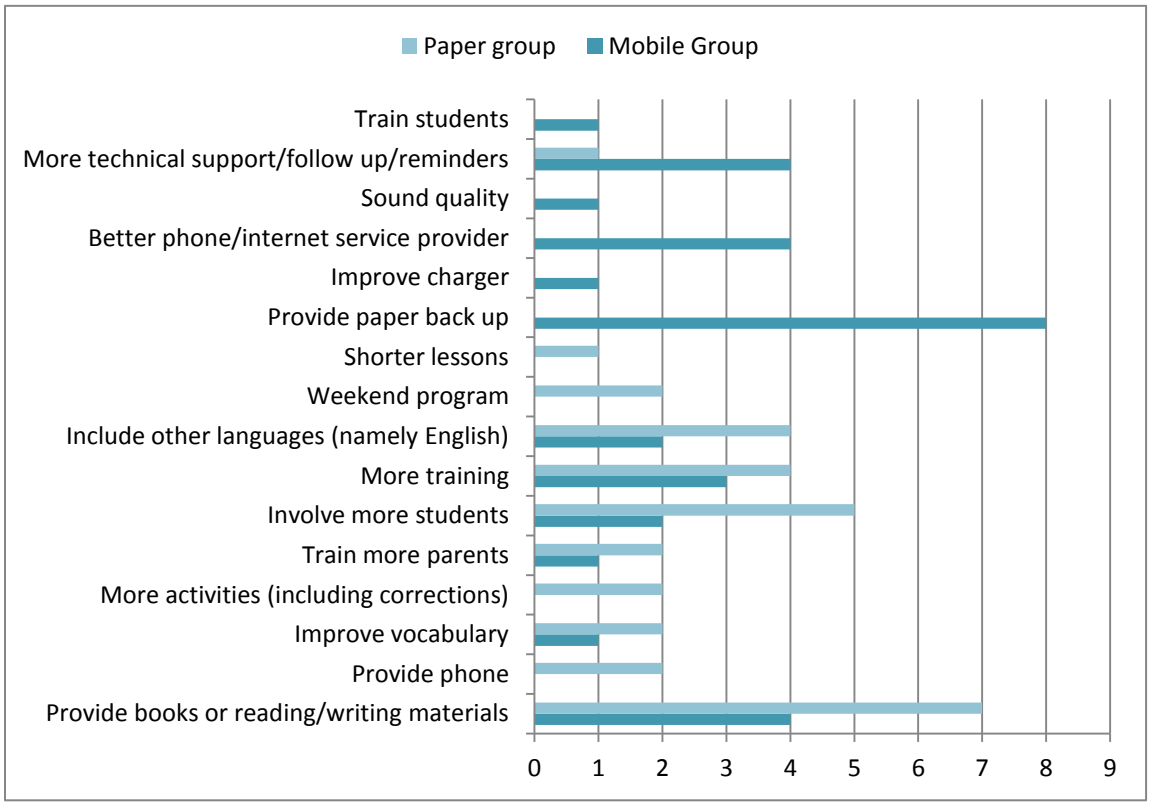
Only half of the Group A parents who confirmed having technical problems with their phones reported that they were able to get them fixed, and this usually with help from the program coordinators. In one-third of the cases the individual found a solution on his or her own. Six out of 16 comments concerning "What other kind of training would have been useful?" were that the program should provide materials (5 of these coming from Group C and one from Group A). Another suggestion in response to this question that also appeared frequently in open-ended answers to the questions "How would you

improve the program?" and "What other problems did you have?" was that parents, regardless of group assignment, would have liked an example of how to conduct the activity with their children.

The question "Did you ever have problems understanding the audio?" (Group A) or "Did you ever have problems understanding the content of the lessons?" (Group B) was meant to elicit specific feedback on the design of the two products; 34% of parents in Group A answered "Yes" and 27% in Group B. The reasons given were mainly related to technical difficulties with the phones, but a few parents answered that the sound or print quality was not clear (4 parents in Group A and 3 in Group B), or that the vocabulary/accent of the speaker posed a problem (3 parents in Group A). In the mobile group (Group A) 8 parents did not know they could repeat lessons on the phone at any time, also indicating a need for more training.

Finally, and more specifically, when asked how the program could be improved (asked only of Group A and B parents), many parents in both groups expressed the need for more materials to read, and specifically parents in Group A requested a paper back-up of the program for times when the phone service was not working. ***Figure 15*** shows the frequency of different responses in each group.

Figure 15: Parent suggestions for how to improve the program



Summary. Overall, parents expressed satisfaction with MLIT in all of its forms and support its expansion to more parents and students; however, many factors unrelated to the design of the materials prevent parents from engaging with their children on a regular basis in literacy-promoting activities. These factors include lack of time, poor health, being away from the child for a period of time, and lack of familiarity with the methods. For parents who do make time and effort to engage with their children, the specific format of the materials can either help or prevent them from doing so on a regular basis. Clearly, for a program delivered by mobile phone to work, the messages must be delivered reliably and must be simple to retrieve and playback (in the case of an audio message). Lessons delivered on paper should also include clear guidelines and practical activities (with corrections, as necessary). Both formats would be improved by having supplementary reading materials to reinforce the lesson content and some additional training or follow up support.

IV. Discussion

4.1 Evaluation of the MLIT product

As described in the baseline report, in order to answer the above questions and report on the results in a way that will best inform decision making in the future with regards to scale up or expansion to other contexts, we have adopted a program evaluation approach that has been used to analyze curriculum packages, new technologies, instructional media, and other educational products introduced to the marketplace.[15] This product-oriented approach allows us to use criteria for formative evaluation of the product while it is under development as well as for summative evaluation of product effectiveness after its use. It emphasizes the information needed to make a decision about adopting a product or not based on effectiveness and utility compared to alternatives. Five key areas of analysis have been selected to summarize the product evaluation (adapted from Scriven, 1991)[16]:

- Need (evidence of need, number affected, absence of substitutes);
- Market (dissemination plan, size, importance);
- Performance (through field trials, with consumers, compared to alternatives, long-term effects, side effects, process/causal claims, statistical and educational significance);
- Cost effectiveness (judgment of costs compared to alternatives); and
- Extended support (plans for training, updating, consumer service).

[15] This is known as a "consumer-oriented evaluation approach." See Worthen et al. (1997).
[16] Scriven, M. (1991). Key evaluation checklist. In M. Scriven, *Evaluation thesaurus* (4th ed.). Newbury Park, CA: Sage.

The evaluation activities conducted in Phase 1 of this grant focused primarily on analyzing the performance of the MLIT-mobile product, by comparing it to two possible alternatives—the same content printed on paper, and general suggestions given verbally to parents (but without specific content). However, other information gathered through the process of implementation and specific survey questions provides context with which to evaluate the product along the other areas of the framework. Some initial observations are included in the following section, but it is anticipated that a full and final product evaluation will only be possible after Phase 2 is completed.

Need

The need for a program to improve early reading ability of Ugandan children, in the Luganda language, is well documented. The original MobiLiteracy Uganda proposal makes the case for the program in Uganda based on low child and adult literacy rates and lack of human, financial, and material resources in schools and homes. These claims have been confirmed through a number of recent studies including work done by RTI and UWEZO, among others. RTI, in a 2010 assessment of early reading[17] pointed to "a crisis of quality in reading skills in early primary education in Uganda" based on the findings that showed an average mean on nonword decoding of only 2.6 words in P2. Additionally, the research found that "very few classrooms have textbooks, very few children have access to their own textbooks, and only a handful of children have access to those materials at their homes." It recommended starting early and having high expectations for what children can do in P1 and P2, and using letter and syllable sounds and decoding as explicit teaching strategies to build early reading skills.

It is also already well-documented in the proposal that parent involvement in children's learning enhances performance, and that a rich literacy environment in the home is associated with better reading outcomes. An evaluation conducted in Northern Uganda by Save the Children showed that less than a third of children have books at home, and less than a third of their family members engage in reading activities.[18] They further noted that "that the percentage of people at home helping children study or encouraging them to study was the most statistically significant predictor of reading scores, especially for the more foundational skills of concepts about print and letter awareness. This means students who reported being supported in the home often had higher scores on the most basic reading skills." A study specifically focusing on parental support in four countries, including Uganda[19], found that across contexts parents' desire to help children succeed in school is high, but they are limited by low self-confidence in their ability to do so. The notion of support is often limited to providing time, space, and materials, but not necessarily content knowledge and support. In Uganda specifically, this study found that

[17] **Uganda** Early Grade Reading Assessment Findings Report. www.eddataglobal.org/reading/index.cfm/EGRA%20Uganda%20FINAL%20121410.pdf?fuseaction=throwpub&ID=293

18 Guajardo, J. et al. (2012). Literacy Boost Midline Report. Available at www.eddataglobal.org

[19] Action Aid. http://www.actionaid.org/sites/files/actionaid/ilops_parents_final.pdf

"44% of parents think they should provide more time at home for studies. Another 32% of parents agree that correcting mistakes and providing general academic guidance is important. However, in practice, only 25% of parents are actually able to provide time for their children to do homework. Of the parents interviewed, in reality 75% do not supervise homework." While literacy or other educational limitations, cultural beliefs, unclear roles and responsibilities between parents and teachers, and livelihoods were all cited as challenges, they do not need to be barriers. There is clearly a need for a product that will help parents provide specific, direct guidance on basic skills to their children regardless of their own literacy levels.

We are aware of few other products besides MLIT in Uganda that do this. While there are many efforts to involve parents in education, they are often limited to school governance and financing issues, and not specific content or homework help. Moreover, resources that do exist usually require parents to be literate to use the materials. For example, Save the Children distributes flip books to parents with simple suggestions and images for parents in other countries, but these have not yet been translated or produced in any Ugandan languages[20]. Plan International in collaboration with Nokia has a program to use SMS messaging to keep parents informed about school governance issues.[21] However, Ugandan book publishers operate mostly in English and there are few local language reading resources available, much less materials like workbooks that are suitable for self-study at home. Mango Tree publishes local language resources, some that can be destined towards home use, but at this time has no specific products in Lugandan for parents.

Thus we can easily conclude that there is a need for the MLIT product in both paper or mobile formats. The social significance of a scalable approach to increasing home literacy practice is sizeable, considering that Uganda has one of the world's youngest populations[22] and more than 8 million children in primary school.[23] The need for a *mobile* version of the product is also compelling because of the multimedia and on-demand nature of the product. Other audio or multimedia formats such as radio and television may be more widely available, but are limited by the synchronous nature of the media. The present research study, as well as others cited above (e.g., ActionAid 2010), confirm that finding time to work with children is already a challenge for many parents, so they would only be further constrained if a product is only available at a specific time of the day. The regular, automated delivery of the mobile messaging and the fact that messages can be replayed can overcome this barrier, making the content accessible when it is convenient for the parent and prompting them on a regular basis to use it (within the limits of network availability, training, etc.) The ability to go to scale rapidly and with

[20] Personal correspondence, Jarret Guajardo. December 2013.
[21] http://plan-international.org/where-we-work/africa/uganda/about-plan-in-uganda/news/text-messaging-increases-parent-student-engagement-at-school-in-uganda/
[22] As presented in the 2012 State of Uganda Population Report.
[23] World Bank. http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/09/23/000333037_20130923130405/Rendered/PDF/E42930Uganada0000PUBLIC00Box379829B.pdf

little on-the-ground support is also a considerable advantage and will be discussed further below.

Market

The market for early literacy materials in Luganda is estimated to respond to the needs of more than 4 million speakers of the language in the southeast, primarily Buganda province, Lake Victoria's northwest shore to Lake Kyoga, and the Tanzania border.[24] It is considered one of the national languages of Uganda, along with English and Kiswahili.

The market for a mobile-phone based product is also large and growing, but may not be as widespread or immediately adopted as prior assumptions. The GSMA (a global association of mobile operators) estimates that 15 million Ugandans have a mobile phone subscription, or about 42% of the population[25]. Analysists attribute this relatively low penetration rate to the high percentage of the population that lives in rural areas (87%). Therefore there are still many people who do not have access to a mobile phone, and this may affect women and youth disproportionately. (During the baseline data collection there were several women who, for fear of retribution from their spouses, refused to accept the phones that would be given to them by the program). Currently in Uganda an individual needs to register with a form of identification in order to get a SIM card—this may be part of the reason for some of the loss/theft of SIM cards in the study. This study provided evidence that there is also some demand for such a product, and that parents would be willing to pay a small amount (around $1) for it. Furthermore, having access to a phone and having access to the phone service—particularly data services, as required by the MLIT SMS+audio model—are two separate issues in judging the potential market for disseminating this product. Even in this peri-urban area, there were still some periods when connectivity was not sufficient to download the messages, although we can't always be certain that an individual's report of network service downtime was accurate—other problems may have been preventing access to messages such as not knowing how to do so, or a full message inbox. Other identified disruptions with message delivery occurred due to changes in the Ugandan service provider's parameters (e.g., acceptable characters) and then lack of a reliable system for identifying and notifying the international service provider (the company that schedules delivery of the messages) of a disruption in message delivery. Thus consideration of market potential must also include the number of intermediaries involved, the ability of individuals of different backgrounds and in different locations to access the service, and other possible points of failure; this would lead to an estimate of realistically how many people may be able to access the product.

In terms of alternatives, this evaluation found some evidence that there is also demand for a simple print resource to help children with early reading at home. One of the assumptions driving the use of mobile systems is that paper is not as durable and may get

[24] www.ethnologue.com, based on 2002 census.
[25] http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/10/GPM-Market-Analysis-East-Africa-v3.pdf

damaged or used for other purposes. This did not prove to be the case in this program; although the fact that this was a research program and parents knew they would be interviewed again at the end of the program may have led to more deliberate use and care of the materials. However, production and distribution of print resources generally requires more human resources on the ground to print, store, and deliver the product. This is after there has been an effort made to make people aware of the product. Much of this coordination is eliminated with a centralized technology that pushes messages out to known phone numbers. The phones can even be used to make people aware of the program in the first place.

Thus if a reliable form of SMS+audio can be delivered to every phone of every Luganda-speaking parent (or other household member) without significant logistical input on the part of a local implementing agency, this would be a significant opportunity above and beyond more traditional, print-reliant methods. However, target individuals also need to know how to access the program the first time, and how to use it (technically and pedagogically). Whether this can be done without some local presence and other elements of dissemination will be explored in more depth in Phase 2 of the program.

Performance

The previous section described in detail the outcomes of the evaluation component designed to test the performance of the MLIT-mobile product against a print alternative and a control group. Through pre- and post-testing of students, using a tool with five different measures of early reading skills, we found that students using the paper-based program showed the most gain, on average, in four out of five of these tasks. Children in the two intervention groups—MLIT mobile and MLIT paper—consistently outperformed children in the control group (who received only verbal input on how to support children). Across all subtests, the proportion of zero scores declined in both the mobile and paper group, whereas the tendency was an increase in zero scores for the control group. Actual average gains for all groups were quite small—only one two correct letters or words per minute. However, the distribution of gains ranged from highs of 20 correct letters and nonwords per minute to 10 (maximum possible) familiar words. There is a strong association between student scores on nonword reading ability and the parents' reporting that they usually did all of the activities that the lesson suggested, and there is a trend ($p=<0.1$) in this direction for familiar word reading. Use of the materials was the only factor that stood out as having a statistically significant association with improvement in students' reading skills. Analysis of SES, school characteristic, gender, types of activities engaged in at home, and parents' education level showed no significant association with outcomes. Therefore it does appear that use of the MLIT materials is effective in provoking a change in reading outcomes, especially for those who started with the least amount of measurable skills. Nevertheless, there were many children who joined the program who did not end up using the materials for a variety of reasons.

Based on the quantitative and qualitative evidence from the assessment and related survey instruments, use of the mobile program may have been hampered by the following.

- **Time**. Parents found it hard to find time to work with their children daily, and over the course of the program, may have had periods of time where they were away from their children for days or even weeks and therefore could not conduct the activities. This includes time when either the parent or the child was sick and also could not engage in the activities for that reason.
- **Technological problems**. Accessing a daily message requires several steps—receiving the message, downloading/saving it to the SD card, then accessing the file on the SD card and opening it. This process was unfamiliar to most users who had experience only with voice calls or sending/receiving SMS. Therefore some people forgot how to access the messages, did not know they could repeat them, did not realize that the message queue could run out of space, etc. Overcoming these barriers required making contact with the program or someone else, and given the above-mentioned constraints with time, parents may not have had the ability to keep up with the program once technical problems were encountered.
- **Motivation**. According to some of the open-ended questions and the informal interviews conducted with parents on the day of endline data collection,[26] some children lost interest in the program after the beginning or were simply not motivated to participate. For both parents and students, the motivation to use the program was entirely intrinsic—there were no rewards, nor was performance recognized by the school in anyway. Participating in the research program might have created some extrinsic motivation, since they knew that the researchers would be coming back to test the students later (see the paragraph on "Hawthorne effect" in the Limitations section).

The instructional effect of the materials may have also been improved if the following were done.

- **Materials**. There were no print materials for the mobile group to look at that corresponded to the content of the program. This may explain the slight advantage observed by the print group. The only print supports were the letters on the keyboard and once a week one of the file downloads was named with the key word of the lesson (for example, "kaapa.amr"). The rest of the file names were numbered, e.g., "lesson_17.amr". The actual SMS notification message stated only the download link, e.g., "MobiLiteracy Uganda http://slooce.net/lesson 31.amr"). Parents in the mobile group also frequently expressed that they would have liked to have books or reading materials to go with the program, or a print

[26] These were conducted by the Mango Tree local program coordinators. However, the researcher then held debriefings with the team each day to get their impressions and record any other findings that may not have fit into the structure of the surveys.

backup in case of message failure. There was also an issue with the translation of the print materials in which the audio messages told the parents to refer to "the text"—meaning the text message; however, the way this was translated into Luganda implied some kind of text book or workbook. So there was also some expectation on the part of the parents and confusion when that expectation was not met.

- **Content**. Review of actual content of the messages, the scope and sequence of the program, and the instructional activities was not part of the scope of this evaluation. The content was developed by UP using Luganda reading experts, and it underwent a review process that was considered sufficient for them. However, some feedback from assessors and even parents in the program at endline indicated that there were inconsistencies in the spellings of some of the key words. Also, RTI noted upon hearing the audio message for the first time that the program was teaching children an incorrect form of the letter sounds (see Limitations). Had the program been teaching the "pure" letter sounds (i.e., "S" makes the sound /ssss/ not /sa/), a greater effect on the letter sound subtask may have been observed. Further review of a complete translation of the content of the mobile program might uncover other aspects of the content that could be improved for more instructional effect. Furthermore, some interactivity was expected with the mobile phone format, but this was not included. This might have also had an effect on motivation.

Cost effectiveness

The Phase 2 evaluation will explore the issue of cost-effectiveness in more detail. The largest costs involved in most instructional programs, but especially technology-based ones, are the initial development costs. In this case, there were also costs of supplying phones and solar chargers to the participants to ensure that this would not be a barrier to using the product (and thus evaluating its performance). In Phase 2, the program will be able to better evaluate the total costs of dissemination and the cost to the participants of accessing the program. This can be compared to costs of a comparable program (for example, the printing and distribution of a print version of the program).

Extended support

The decision to adopt any education product needs to also consider what is required in terms of extended support, content updates, renewals, distribution, marketing and continuous monitoring and improvement. Therefore a complete evaluation or comparison of one product versus another should take into consideration this aspect. In the case of the MLIT-mobile product, one of the assumptions is that distribution and marketing will be much easier through pushing this product to devices that many individuals in the target demographic already have. It also assumes that there is little or no long-term local presence required in the form of a project or institution to manage distribution and maintain functionality. However, Phase 1 of this program—which was essentially a pilot

project testing a concept for the first time in the particular context—indicated that there may be more of a need for a local presence than initially anticipated. Many of the parents reported that even though they had training and orientation on at least two occasions, they still sometimes had trouble accessing, downloading and listening to the messages, and when they had technical difficulties they were not always solved, or solved rapidly. On the other hand, parents in the paper program needed less guidance in order to understand what to do with this more traditional form of support. If they were away from their child, or if they couldn't read, it was easier to pass the booklet to someone else to do the activities.

Therefore it is important to be able to answer the questions: Will parents be able to adopt the mobile program in the future without any orientation or guidance on the process? Will they be able to troubleshoot problems that arise with the phones or message delivery? We can hope that when, in the next phase, parents are self-selecting into a group with the knowledge that it is a mobile phone program and they will be using their own phones, then they will be individuals who are more familiar with the phone functionality and may be more at ease with the process. But if this is true, then the mobile format is biased towards a certain demographic who may already have other characteristics that put their children at an educational advantange (more urban, higher socio-economic status, higher education level). Therefore the program might not benefit those who need it the most. Ultimately, sustainability and scaleability will depend on securing a partnership or partnerships with the local telephone service providers to adopt and manage the program, including owning the results and and profits that come from subscriptions to the service and communications costs. These are issues that Phase 2 will explore.

4.2 Implementation of the MLIT evaluation

This report is not a program or process evaluation of the implementation of the MobiLiteracy program (i.e., the partners, the organizational structures, the decisions, etc.) It seems important, however, to reflect on the process of using an experimental design to judge the worth of a product that actually hadn't yet been developed or used in the specific country context. Many evaluation experts argue that "impact" evaluation is something that is only done once a specific product has shown some promise and has been well-established enough to work out the most basic implementation issues.[27] Even a *summative* (end-of-program) evaluation approach usually follows some kind of *formative* evaluation that has been designed to check progress, identify, and correct issues before it is too late. In the case of this grant, in the interest of having actionable results with which to address a critical human development need in a short timeframe, the program essentially used an experimental design for the formative evaluation of MLIT. This was based in part on the fact that the implementing organization had experience delivering a similar instructional method (mobile phone SMS+audio for language learning) in other

[27] Worthen, B., Sanders, J., and Fitzpatrick, J. (1997). *Program evaluation: Alternative approaches and practical guidelines* (2nd ed.). White Plains, NY: Longman Publishers USA.; Perrin, B. (2012). *Linking monitoring and evaluation to impact evaluation*. Impact Evaluation Notes. InterAction and the Rockefeller Foundation.

countries with demonstrated success. All formative assessment-type activities under this grant were undertaken by UP alone or with the local partner and were not part of the scope of this product evaluation.

Therefore this situation created certain challenges, and it is possible that the results for the mobile group could have been better if the product had the time to test message delivery; to review more extensively the instructional content (to address the letter sound and spelling issues); to test the training/orientation approach, message format, and service provider; and to discover other key contextual barriers such as women's hesitancy to accept mobile phones.

Additionally, the rigor of the experimental design created certain conditions that are not necessarily those that would be found during a situation where the program is replicated on a larger scale. First of all, the validity of the experimental design depends on the random assignment of participants to a research or control group. Therefore parents who didn't know how to use a phone ended up being assigned to the mobile group and parents who don't know how to read were assigned to the paper group. During scale-up, it is more likely that parents would self-select into the program based on their prior experience and capabilities. Similarly, for the purposes of the evaluation it was important to ensure that every parent in the mobile group had a phone with a valid SIM card and a data plan, and so the program provided the phones, the solar chargers and the data plan. During scale-up, participants will be using their own phones and paying their own data charges. Under these circumstances, we might expect parents to take better care of the phones and SIM card, and use the program more regularly to get the value for their money. This is one of the assumptions that Phase 2 will try to address.

5. Recommendations and next steps

5.1 Recommendations

We can broadly conclude from this program that providing a daily supportive routine can help parents increase their engagement in reading activities at home, and using mobile phones can be effective in prompting this regularity. Use of these materials is also associated with modest increases in student learning outcomes on measures of early reading skills. However, a similar program in a printed format is equally valued and used by parents and can also make as much of a difference in students' learning outcomes. Having established that learning gains are comparable between the two formats (paper and mobile), there remain other reasons to pursue a mobile-phone based program: potential for scale through ease of distribution and the advantage of the audio format for reinforcing sounds, syllables, and specific word pronunciation. For this reason, and because the MLIT-mobile product is the object of this evaluation, the following recommendations concern only how to improve on the mobile product.

To improve participation and use of MLIT:

- Seek a technological alternative that reduces the steps required to access and open an audio lesson, and reduces dependency on a data plan and connectivity. For example, distributing the audio files in advance on an SD card, then the daily SMS messages are just a reminder of the sequence and a prompt to do the next file in the sequence. (This would, however, negate the rationale of using mobile because mobile SMS eliminates complicated distribution logistics that distributing SD cards would entail. It would also increase the costs if the SD cards need to be purchased, instead of using what exists on the phone already). Another possibility is that the audio be distributed in the form of a voicemail recording that is either sent to the user's phone, or available when the user calls in and listens to the unique recording every day through and interactive voice response system (IVR).
- If such an alternative is not possible without creating other costs or complications, then improve the process of orientation to make it clearer and provide more tips for troubleshooting in case of errors or problems. It may be worthwhile to consider whether a small tip-sheet or visual step-by-step guide could also be distributed with the program as a longer term reference. Again, in the interest of keeping production and distribution costs and logistics down, the program might also create an audio message delivered at periodic intervals that explains the steps for retrieving messages and gives troubleshooting tips (though the user would still need to know how to access that message.)
- Involve more than just one household member in the orientation. This pilot indicated that siblings and even the P1/P2 children themselves often took over the activities when the parent could not. Involving them in in the orientation program to learn how the mobile phone functions and how to access the messages would enlarge the circle of available trouble-shooting support when needed and help ensure continuity of the program when parents are unavailable.
- Expand the program to include younger children. The data indicate that this program is having the most effect with children who have the fewest skills to begin with. Therefore, it could potentially be used even before P1 as a school-readiness activity, or for reading remediation.
- Provide parents with an actual demonstration of how to use the content with a child. This could be done in person during orientation, or perhaps through a video or simulation of a parent with a child. The program would have to determine how to make such a video available without significant constraints, but some parents might be able to access this as a web resource at a community internet access point, or alternatively through some type of organized community meeting to support MLIT users.
- Utilize past participants to spread the word and provide support to other parents may be the best way to expand adoption of the product as well as technical

support related to its use. Could parents who complete the program and send the registration link to another parent get a bonus lesson? Could they get further bonus lessons or mobile phone credits if that new user then completes the program? Could they receive some type of recognition or incentive for organizing a meeting for other new users? This type of activity may need to be coordinated by a school-based champion who has experience with the program and has seen its benefits.

- Explore how the program could take advantage of older youth in the community to distribute and carry out the lessons with younger children. Given the findings from this study—that it was often sisters and brothers who took the place of the parents in the program—and increasing interest on the part of donors such as USAID to increase opportunities for youth engagement, there might be potential to expand the program within the context of a youth entrepreneurship or workforce readiness (i.e., training future teachers) program.
- In addition to finding a solution for users to overcome technical difficulties with access or retrieval of the audio messages, develop a better system in place for identifying complete breakdown of the system at the origin. During the pilot it took nearly two weeks for the organization in charge of distributing the messages to be notified that messages were not being sent and/or received by the users. This happened because the local partner organization was alerted to the problem by a parent in the program. In the future, if the objective is to have as little local coordination as possible, how will this type of issue be identified and addressed in a more timely way?
- Another advantage of the mobile format over paper is that it has the potential for interactive elements such as games or quizzes that can increase participant interest and engagement. This can be done with automated server responses to a specific SMS syntax. For example, MLIT sends a message that asks "What letter can you put at the beginning of these to make a real word?: _aapa. Choose respond and send the letter as an SMS." (123 characters). Depending on the user's response, the user would get a return SMS that says "Right!" or "If you put a K in front it makes the word KAAPA!" This would increase the costs of the program, because it would require increased SMS costs from both the user and the program, but further exploration of the local context and mobile subscription options might uncover a feasible alternative. This and other game-based elements (i.e., progress tracking, leader boards, etc.) could increase motivation and engagement, and potentially also the instructional effectiveness of the content. Care must be taken to ensure that these elements are accessible and comprehensible to all parents, including those who can not read[28].

[28] These elements were intended to be part of the program from the start, but because the final technological solution required an international 'long code' delivery mechanism, rather than a local short code which would have been possible only through support from the local operators, the the interactive element couldn't work.

According to data in this study, frequency of engagement in general types of literacy-promoting activities is not enough to have an effect on student outcomes. However, engagement with the specific content of the program does. Therefore parents who are willing to help their children at home need very specific and relevant content to use to work with their children. This instructional content has to be adequate (i.e., evidence-based pedagogy of reading in the local language), and it has to be effectively implemented by the parents.

To improve the instructional content of MLIT:

- Address the issue of letter sounds and spellings of the words used in the program. For the current, standardized orthographies of the words, there are sources of expertise in Uganda that can be called upon. First, there are local language boards tasked with standardizing the orthographies through participatory processes. Second, the Ministry of Education is currently developing, with the support of the USAID/SHRP project, local language primers for use in the schools. The MLIT content should be aligned with these materials, which have been vetted and approved by a variety of experts. Other local organizations such as SIL and Mango Tree should also have experts available who can provide insight on the current acceptable spellings of common words. Where it is not possible to get consensus on a certain spelling or pronunciation, perhaps an alternative word can be found. The issue of letter sounds is a bit more complex, and many Ugandan pedagogues (including Ministry of Education officials) may still claim that the letter name is the same as the sound, but reading research around the world recognizes and promotes the importance of teaching the sounds of the letters separately from the name, and ensuring that the sound is isolated from any extra 'schwa' or vowel sound. The program materials must be re-recorded to ensure that scale up of the materials is not perpetuating an incorrect understanding of letter-sound correspondence.
- Provide more text-based resources to read. Although the gains were small, the research group using the paper materials tended to outperform the group using the mobile materials. This—and feedback from the parents in the mobile group, as well as research evidence from reading experts worldwide—suggests that having eyes on print is an important part of learning how to read. Although the mobile program is designed to avoid issues with print production, distribution, and durability, there may still be feasible opportunities to improve the instructional power of the product by providing more opportunities for children to actually view the words in print rather than only listening to them. For example, the product could make better use of the actual text of the SMS messages. Although they only allow a maximum of 160 characters, this is enough to present the children with simple sentences or strings of rhyming words, or games (e.g., "Choose the one that does not belong: kaapa, kyayi, mama"). Similarly, the audio

lesson file name could always include a key word or phrase, rather than just periodically.

- Provide access to actual printed resources. Exploring the possibility of providing access to some kind of printed resource along with the mobile program might not have to go against the fundamental design premises of the mobile program (low distribution costs and logistics). For example, to make users aware of the program and how to sign up (and, as mentioned above, a step-by-step guide to accessing the messages), the program could print these basic instructions on one side of a page, and on the other side, include the letters of the alphabet, the key words, and images. This could be laminated and produced once in a large quantity at low cost. In partnership with some kind of local organization—for example, the phone company[29]—the laminated cards could be made available free of charge to take, use, and then pass on to another family after the program is finished. Other points of distribution could be schools, libraries, or community associations. In partnership with a local newspaper, MLIT content could also appear in a regular spread in the paper.

5.2 Next steps

The purpose of this grant is to develop and test an effective, scaleable, and sustainable approach to improving reading practices in Uganda. Phase 1, through the initial pilot implementation and the present evaluation, has provided evidence that the initial version of the mobile-phone based product is more effective than one alternative—no support from a parent, or only verbal encouragement and oral literacy practice at home. It has also shown to be as effective as another alternative—a self-directed print resource with the same content as the mobile program. Phase 2 of this program will therefore aim to determine whether uptake of the program and outcomes persist in an environment where the conditions are designed for scaleability and sustainability. The anticipated next steps include the following key elements, and will be refined over the course of the next few months[30]:

- Discussions and negotiations with local telephone service providers to get their support for hosting, distributing, and maintaining the program, in addition to collecting the fees. This will depend on them seeing either a viable profit model through scale or potential for market visibility and positive corporate social responsibility.
- Discussions with local telephone service providers or other organizations about the potential of converting the program to IVR format rather than a downloadable

[29] Many individuals pay their phone bills, register for a SIM card, or purchase pre-paid credit at a kiosk run by the phone company or an affiliate, even individuals who make a living doing this. These could be the points where such a card is distributed.
[30] As discussed between the author of this report and the UP program manger. Specifics are subject to change.

audio file, to improve access to the program through reduced dependence on data connectivity and more intuitive functionality.

- Dissemination of the results of the program to encourage other parents to sign up for the service and to encourage the above-mentioned partnerships. This will include recontacting Phase 1 participants to offer them the service; making contact with other schools and youth-focused programs to make them aware of the results; disseminating the results in appropriate meetings and conferences (for example, Mobile Learning Week in Paris [February 2014] and eLearning Africa in Kampala [May 2014]) in order to generate interest in distribution.
- Revision of the materials to address the issues with letter sounds and word spelling. Revising, if necessary, the instructional design of the content to include interactivity appropriate to the final format (whether SMS+audio or IVR).
- Developing the research design and methodology that will allow for answering the research questions regarding scaleability and sustainability; more specifically: need, market, performance, costs and extended support of the revised model.

Annex A: Evaluation Standards

This program, being both a pilot of a new method for delivering education services, and an evaluation into the method's effectiveness, is designed to adhere to certain research and evaluation standards. The following standards were proposed by Herman, Morris, and Fitz-Gibbon[31] and guide RTI's contributions to the design and conduct of the evaluation:

- Utility – does it serve the practical information needs of the audience (timeliness, clarity, scope, etc.)?
- Feasibility – is the evaluation realistic, prudent, diplomatic, and frugal?
- Propriety – does it adhere to legal and ethical standards, regard for welfare, full disclosure, institutional review board (IRB), etc.?
- Accuracy – does it use adequate information about and valid measurement of the features of the object being studied? Is it objective and complete?

Utility. We believe that the evaluation will be very useful to the client (the All Children Reading consortium) as well as other m-learning practitioners if the results can be widely disseminated. Currently there are abundant examples of m-learning initiatives being implemented globally, but very few that provide empirical evidence of their effectiveness[32] in terms of learning outcomes, especially compared to other available alternatives. Therefore the timing of this research is extremely relevant. The existence of comparison groups against which to compare the MLIT program results will provide important information about the utility of a mobile-phone based literacy program in the specific context compared to alternatives.

Feasibility. The evaluation was designed to be feasible and cost-effective, drawing on existing resources as much as possible (existing instruments, experienced assessors, knowledge of the local context given existing partnerships, and field presence in the country chosen, etc.). Selection of the participants from schools near the country's capital, Kampala, allowed the program to keep costs of this first-time implementation and evaluation low while maintaining the rigor of the design. (Whether the results are generalizable to other, more rural areas, is a potential concern that will be explored in the endline report.) Introducing too much variation in the sample, i.e., by including both urban and rural schools, would have limited the statistical power of any correlations found within this group.

[31] Herman, J., Morris, L., and Fitz-Gibbon, C. (1987). *Evaluator's Handbook.* Los Angeles: Sage Publications and Center for the Study of Evaluation, University of California, Los Angeles.

[32] Strigel, C., and Pouezevara, S. (2012). *Mobile learning and numeracy: Filling gaps and expanding opportunities for early grade reading.* Berlin: Deutsche Gesellschaft für Internationale Zusammenarbeit.
(GIZ) GmbH; Traxler, J. (2013). *Be still and know.* Presentation given to the mEducation Alliance, July 2013.

Propriety. The program implementation and evaluation have insisted on maintaining ethical standards and protecting the welfare of the participants. All instruments underwent IRB approval within RTI prior to use, and all participants—parents and students alike—were fully informed about the conditions of participation, expectations of personal gain, risks involved (of which there were none foreseen[33]), and responsibilities of each of the partners.[34] Although it was lengthy and detailed, the consent process used simple language, in Luganda; individuals who were unable to understand or otherwise consent to the process were not interviewed. As described in the limitations above, there is some concern about the marginalization of the participants of the paper-based group, who were provided with a product that may not meet their needs. From an ethical standpoint all groups should have been provided with high-quality inputs that could realistically be expected to promote literacy development. All participants were provided with the option to decline to either participate or complete the interviews at any time. Additionally, all participant information is being kept confidential and no identifying information will be included in reports. Finally, the reports disclose the extent to which each participating organization has a stake in the outcomes (particularly the baseline report), and any limitations to the objectivity of the evaluation are explained in the Limitations section.

Accuracy. The extent of the parent and student interviews provides multiple sources of information that can be triangulated for greater accuracy (for example, including both student and parent reports of certain literacy practices) and thus confidence in determining the effects of MLIT on participants. The EGRA instrument is well known to provide technically accurate information about students' early literacy skills, the kinds that are being promoted by the MLIT program. In addition to this outcome measurement, details on context and implementation are being gathered in order to explain outcomes in an objective manner. Limitations to the ability of instruments to measure desired changes are outlined clearly in the report.

[33] No one anticipated that giving mobile phones could be a potential risk to female participants because the husbands might become upset or suspicious. When this objection was raised by the participants, they were not pressured to participate, although program coordinators made an effort (with permission from the female volunteers) to contact the husbands and provide additional explanation to make sure there was no misunderstanding.

[34] Express consent was only required by RTI for participating in the interview. It was Mango Tree's responsibility to ensure consent for participation in the larger program from beginning to end, and this was done verbally at the time of recruitment and again when the inputs were delivered.

Annex B: Roles and responsibilities of project partners

Activity	Partners involved
1. Research design	**RTI** designed the research and sampling framework**,** identified sample schools, and managed the IRB approval process for determining methods of obtaining consent and tracking of participants. **Mango Tree** managed participant recruitment into the program, consent to participate in the research program, and assignment of participants to treatment and control groups.
2. Product development	**UP** designed the MobiLiteracy program, developed the content of the SMS+audio product, recruited language expert advisors and translators, and negotiating and solving international distribution of the media to mobile phones. **UP** conducted a formative evaluation of the product (SMS messages and audio recordings) through a focus group with parents prior to the Phase 1 implementation. **RTI** reviewed a printout of the product after it was completed, made suggestions on presentation of the material for the print group, and double-checked some aspects of language orthography with other language experts, as part of the process of preparing assessment instruments.
3. Data collection instrument design	**RTI** designed the student reading assessment (EGRA), student questionnaire, and parent questionnaires (the parent and student questionnaires are mostly uniquely designed for this program; the EGRA was adapted from the existing instrument used by USAID/SHRP). **UP** reviewed and commented on the instruments; provided the list of familiar words based on what words are used in the program; and provided a translator to translate the instrument into Luganda. **CSR** and **Mango Tree** provided revisions to the translations during the training period.
4. Assessor training	**CSR** recruited the assessors from among its staff and roster of expert researchers, provided a venue for training, and organized the logistics of the training (i.e., meals, materials). **RTI** delivered in-person training to the assessors through an experienced trainer, measured inter-rater reliability, and monitored quality of assessors. **UP** identified a local partner, the Literacy Association of Uganda, which recruited adults and their children with whom data collectors practiced administering the instruments during training.
5. Data collection	**CSR** researchers administered EGRA to students and conducted parent interviews, obtained consent from both for participation in the interviews, and arranged transportation for data collection. **Mango Tree** communicated with schools and local education officials to schedule the dates for data collection and to ensure that parents and their children would be present on the scheduled day; and provided a small payment to parents and teachers to cover costs incurred (such as airtime and transportation) and refreshments on the day of data collection; and conducted some parent interviews. **RTI** provided tablets for electronic data collection; supervised data collection procedures, ensuring adherence to the research principles (see ***Annex A***) monitored quality of data collection through observation of assessor behaviors, and helped manage movement of students and parents during data collection.
6. Program implementation	**Mango Tree** helped test the mobile infrastructure, provided training and orientation to all three groups after baseline data collection had taken place, and delivered the mobile phones and printed materials. **UP** designed the content of the print and audio mobile programs and coordinated work with Mango Tree. UPM determined the technological infrastructure and established a stable delivery platform, tested a variety of basic phones, and arranged with distribution partners to deliver the SMS with audio recordings daily to the Group A partipants utilizing an international long code.
7. Data analysis	**RTI** conducted data processing and analysis (maintaining sole access to the raw data) and wrote the data analysis report. **UP** reviewed a draft of the report to ensure clarity and accuracy.

Annex C: Parent Instrument

In the interest of space, only the instrument for the mobile group is included. Questions for the paper and control groups are largely equivalent, with adaptation only as necessary to replace references to phones with reference to paper. This version of the instrument is a paper backup, but the actual instrument was rendered and used in electronic format, therefore some elements like skip logic or validation are not necessarily evident here. Finally, the formatting may have changed when included in this annex. For full copies of all of the instruments for all groups, please contact the authors.

Omuvuzi W'omusomo Gwo Ku Simu : Ebibuuzo By'omuzadde/Alabirila Omwana.

Fomu yo kukiriza okwetabamu (Copy ya'betabyemu) : Participant copy

Wasuze otya nyabo/ ssebo. Amanya gange nze ___ era nkola mukitongole ekinonyereza kumbeera z'abantu mu Uganda, "Urban Planet" ne "RTI International" nga tugezaako okutegeera ebikwata ku bazadde awamu n'abaara byebakola okuyaiga okusoma ewaka. Ekigendererwa ky'okunonyereza kuno kwe kutegeera bulungi engeri abazadde gy'ebasobola okuyambamu abaana baabwe okuyiga okusoma. Minisitule y'ebyengigiriza eya Uganda ekimanyiko nti okunonyereza kuno kugenda mu maaso era ewagila entekateeka eno.

Oli wano olwaleero, olw'ensonga nti wakiriza okwetaba mu ntekateeka y'okwongera okutumbula eby'ensoma n'omwana wo mu ssomero lino. Okwetaba kwo mu kunonyereza kuno kujja kutumanyisa oba entekateeka eno ekola. N'olwekyo, nandiyagadde okukubuza ebibuuzo ebitonotono ku bintu by'okoze n'omwanawo mu myezi esatu egiyise mu ntekateeka eno.

Mu kimu ku bitundu mukunonyereza kwaffe, tusaba omwanawo, asome ennukuta, ebigambo n'emboozi enyimpi. Okugezesebwa kuno, kwakozesebwako dda mu Uganda era kutwala edakika kuminataano zokka nga tekulina bulabe bwekuleeta eri omwana wo. Ebinaava mu kunonyereza kuno bigya kukumibwa nga bya kyama: Tetujja kuwa nkola ya mwana wo mu kugezesebwa kuno eri omuntu yenna atakola naffe mukunonyereza kuno, naye tujja kwekenenya enkola y'omwana wo awamu n'enkola y'abaana abalala.

Ngenda kuwandiika byongambye mu kuuma kano naye sijja kuwandiika liinyalyo. Mukifo kye liinya lyo, njakuwandiika enamba yo ey'ekyama okukakasa nti byozemu bikumibwa nga bya kyama. Bantu batono nnyo mu ntekateeka eno abajja okulaba amaanya n'enamba z'ekyama ezigenderako. Tetujja kukozesa liinya lyo oba ely'omwana wo mungeri endala yonna. Amanya gamwe gajja kukumibwa UPM ne RTI, okukubulira bwebaliba balina ebikolwa ebirala bye banayagala okuyita wetabemu. Era bwewaba nga waliwo ebibuuzo by'otayagala ku ddamu., tokakibwa kubiddamu.

Oyinza obutaganyurwa mu kunonyereza kuno, naye by'onatubulira bigya kutuyamba okutunbula eby'okusoma wakati w'abazadde n'abaana baabwe. Olina eddembe okwetaba mu kubuzibwa kuno era oyinza okugana okukwenyigiramu kati oba ekiseera kyoona mumaaso bwoba nga tokyayagala. Njakukuwa olumu ku lupapula luno olutereke. Luliko ebitukwatako bwoba nga oyagala kututukirira otubuuze ebibuuzo ebirala by'olina ku ntekateeka eno. Olina ekibuuzo kyonna kye wandy'agadde okumbuuza? Okkirizza okwetaba mu kazannyo kano? Kale katutandike.

Good day! My name is ____ and I am working with the Center for Social Research, a Ugandan research organization. I am working with Urban Planet Mobile and RTI International to gather information about parents' and children's reading practices at home. The purpose of this survey is to better understand how parents can help their children learn to read. The Ugandan Ministry of Education is aware of this research and supports this study [show letter of authorization].

You have been selected for this interview because you volunteered to participate in a reading improvement program with your child at this school. Your participation in today's interview is important because it will provide us with information we can use to understand whether the program works. Therefore, I would like to ask you a few questions about things you have done with your child over the past three months, during the program.

As part of our research, we will also give your child a short reading test. We will ask your child to read letters, words, and a simple story. This test, which has already been used in Uganda before, takes about 15 minutes and poses no risk to your child. Your child's test results will remain confidential; we will only record the child's name on this piece of paper to to make it easier to call the child when it is his or her turn We will not provide your child's scores to anyone

outside the research team, but will analyze them together with those of many other children.

I will ask you and your child's names to make sure I have interviewed all the parents and children who have volunteered to participate today. I also will ask you to verify your mobile phone number. I will give this paper back to the project coordinators at the end of the day. The information will be kept by UPM and RTI and will not be shared with anyone not working with this project.

I will never record your name in the tablet computer. Instead of your name, I will type an identification number, or code, to keep your answers private. Only a few people on the project team will see the names that match the codes. We will never publish your name or your child's name when we write about what we learned from this study.

Your and your child's names will be kept on file by UPM and RTI so that we can contact you later for another interview. It will also be kept so that we can match your responses with those from your child. UPM may keep your name and contact information after the project ends in case they choose to contact you for follow-up activities.

And if there are any questions you do not want to answer, you do not have to answer them.

While you will not personally benefit from participating in this interview, your responses will greatly help us to improve reading programs for children and their parents.

Once again, your participation in this interview is entirely voluntary and you may refuse to participate now, or stop participating at any time. I will also give you a copy of this form to keep. It includes contact information in case you have any additional questions about the program. Do you have any questions? Are you ready to get started?

FOR INFORMATION CONTACT: **Solomon Ogwal: 0704 302 250** **Taiga Charles: 0702 689 431**
sogwal@mangotreeuganda.org ctaiga@mangotreeuganda.org

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EBIRAGIRO ERI OMUBALIRIZI - INSTRUCTIONS TO ENUMERATOR

- Only interview the PERSON WHO WAS INTERVIEWED AT BASELINE OR ANOTHER ADULT WHOM THEY HAVE INDICATED AS THE PERSON WHO ACTUALLY DID THE PROGRAM of children who were assessed at baseline.
- Ask each question verbally, as in an interview. DO NOT READ THE ANSWER OPTIONS TO THE PARENT UNLESS INDICATED TO DO SO.
- Wait for the Parent/Caregiver to respond to each question, then tick the box (☑) that corresponds to his or her response.
- Pay attention to the difference between "I don't know" (also includes, "I don't remember" and "I don't understand" and "I don't have an opinion") and "No response" (total silence or saying "I refuse to answer the question")
- Only one response is permitted, except where indicated otherwise.
- Add additional information in the spaces provided or on the reverse side of the paper, with question number clearly indicated.

PART A: DEMOGRAPHIC DATA [TO BE COMPLETED BY SUPERVISOR PRIOR TO INTERVIEW]

A.	Interview date						
		D	D	M	M	Y	Y
B.	Time the interview started					(USE 24 HOUR CLOCK)	
		H	H	M	m		
C.	School name:						

D.	School code:	
E.	Assessor name and code:	
F.	Gender of the respondent?	Male ☐ Female ☐
G.	**Parent's code** [Refer to participant list for code]	
H.	**Child's code** [As generated by Tangerine, i.e., XYCGB, refer to participant list]	
I.	**Relationship to child:**	Mother ☐ Father ☐ Grandparent ☐ Aunt/Uncle ☐ Sister/Brother ☐ Other adult: ☐
J.	**Is this the same person who was interviewed previously?** [IF NO, complete additional demographic questions at the end of this section]	Yes ☐ No ☐
K.	**Olina esimu eyakuwebwa mu ntekateeka eno?** Do you have the phone with you that was given to you for this program?	Yes ☐ No ☐
K1	[if YES to K] (**Can I see it?)** [Indicate condition]	Like new ☐ Used but good condition ☐ Damaged but functional ☐ Damaged, not functional ☐
K2	[IF NO TO K] **Mbulira lwaki esimu eno togirina?** Please tell me why you do not have the phone with you.	Forgot at home ☐ Phone is lost / stolen ☐ Phone is broken ☐ K2-time) **Bweba yabula, emaze bangaki nga ebuze?** [if lost/damaged/broken enter number of days ago] _____ Someone else is has the phone ☐ Other ☐ Specify: I don't know ☐ No response ☐

K3	**Esimu yo ogi kyaginga otya?** How did you normally charge the mobile phone?	In an electrical outlet at home ☐ In an electrical outlet other than home ☐ Using a car battery ☐ Using a solar charger ☐ Other ☐ Specify: I do not know ☐ No response ☐
K4	**Okyalina charger ya solar eyakuwebwa muntekateeka eno?** [Do you have the solar charger with you that was given to you for this program?]	Yes ☐ No ☐
K5	[IF NO TO p] **Mbulira lwaki charger ya solar eno togirina .** Please tell me why you do not have the solar charger with you	Forgot at home ☐ Charger is lost / stolen ☐ Charger is broken ☐ **K5_other: Bweba yabula, emaze bangaki nga ebuze?** [if lost/damaged/broken enter number of days ago] _____ Someone else has the charger ☐ Other ☐ Specify: I don't know ☐ No response ☐
K6	[IF YES TO o] Condition of the solar charger	Like new ☐ Used but good condition ☐ Damaged but functional ☐ Broken, not functional ☐ Other ☐ Specify n/a (charger not available) ☐
L.	**Musomo ki gwe wasembayo okufuna kusimu eno?** What was the last lesson you listened to on the phone? [Verify and write number of last lesson downloaded visible on phone. If "never" enter the number "0"]	Participant response ☐ Don't know ☐ No response ☐ L1: Last lesson visible on phone ☐ L2: Last SMS visible on phone ☐
M.	[If not "0" to L] **Mukutebereza, wawuliriza ddi lino esomo eryasembayo?** Approximately when did you listen to this last lesson?	Enter number of days ago:

N.	[If not "0" to L] **Wali owuliriza amasomo gonna agosooka ku lino?** Did you listen to all of the lessons prior to that one?	All ☐ Some ☐ None ☐ I don't know ☐ No response or not applicable ☐
O.	[IF "zero" to "L" or "none" to "N"] **Mbulira lwaki tewakola yo ssomo lyonna.** Please tell me why you never did any of the lessons. [DO NOT READ OPTIONS. SELECT THE OPTIONS THAT MOST CLOSELY MATCHES THE MOTHER'S RESPONSE. YOU MAY TICK MULTIPLE OPTIONS.]	Someone else did the activities with my child ☐ I did not understand what I was supposed to do ☐ I did not have time ☐ My child did not have time ☐ Material too difficult ☐ I/my child did not find them fun/interesting ☐ I/my child did not understand the audio/SMS ☐ Mobile phone lost, damaged or stolen ☐ Mobile was not charged ☐ I was sick or injured ☐ My child was sick or injured ☐ Technical problems (download, open) ☐ Other ☐ Specify: I don't know ☐ No response ☐

Webale nnyo byotubulidde. Tukusaba oguminkirizeko ababuuza abalala betegeke bakubuuze ebitonotono ku kwetaba kwo muntekateeka eno.

Thank you for this information. Please wait until one of the other interviewers is ready and they will ask you a few questions about your participation in the program.

Based on the above information, this individual is considered: ☐ A participant

☐ A drop out

ADDITIONAL DEMOGRAPHIC QUESTIONS FOR REPLACEMENT PARENTS (IF NO to "J" ABOVE)		
1.	**What is your age?**	
2.	**Wasoma paka ku ddala ki?** What is the highest level of schooling you have completed?	None ☐ P1 ☐ P2 ☐ P3 ☐ P4 ☐ P5 ☐ P6 ☐ P7 to S6 ☐ Higher than S6 ☐

		Do not know/No response ☐
3.	**Lulimi oba niimi ki zewandigambye nti osobola okuzisoma no'kuziwandiika obulungi?** What language or languages would you say you read and write well? [MULTIPLE RESPONSES ALLOWED. CHECK ALL THAT APPLY]	None ☐ Luganda ☐ English ☐ Other ☐ Do not know/No response ☐
4.	**Nkusaba onyonyole emirimu gyokola okubezawo amaka gwo, nga oyongeza ko emirimu gyona egyokulabirila abaana na'maka. Tewali nsonga bwoba tolina mirimu mirala gyokola okujako egya waka.** Please describe the primary type of work you do to support your family, in addition to any home-based childcare and household work. If you do not work outside the home, that's OK.	Unemployed outside the home/do not conduct work that generates income) ☐ Agriculture, farming and/or fishing ☐ Informal sales (sell food, crafts or other goods from home and/or at a market) ☐ Construction worker ☐ Formal business owner ☐ Teacher ☐ Other professional job besides teacher (NGO worker, manager, office assistant, etc.) ☐ Other ☐ Specify: _____ Don't know/No response ☐

PART B: QUESTIONS ABOUT TRAINING (ALL)

Ngenda kukubuuza ku kwetaba kwo muntekateeka yokutumbula okusoma. Mbulira endowoozayo no'bwesimbu. Byodamu bigenda kusigala nga byakyama era tetujja kuwandiika linnya lyo. Byo'genda okutugamba byamugaso nnyo era bijja kuyamba okulongosa entekateeka eno gyebujja.

I'm going to ask you some questions about your participation in the mobile phone literacy project. Please tell me your honest opinion. Your responses will remain anonymous and will not be associated with your name. Your feedback is very important and will help to make the program better in the future.

1.	**Wetaba mukusomesebwa okukwata kuntekateeka yo'kuyiga okusoma ne'ngeri yokugiteeka munkola?** Did you participate in a training activity (orientation meeting) to learn about the mobile literacy program and how to implement it?	Yes ☐ No ☐ I don't know ☐ No response ☐
2.	**Wali mwetefuteefu kyenkanaki okussa entekateeka eno munkola?** How well-prepared did you feel to carry out the activities with your child?	Very well prepared ☐ Somewhat prepared ☐ Not at all prepared ☐ I don't know ☐ No response ☐

3.	**Kusomesebwaki okulala okwandibadde okwomugaso?** What additional training would have been helpful? [DO NOT READ THE OPTIONS. TICK ALL RESPONSES PROVIDED BY THE PARTICIPANT]	More initial training on how to teach letters/words/reading ☐ More initial training on how to use the mobile phone ☐ Follow-up training or support on technology issues ☐ Follow-up training or support on reading issues ☐ No additional traning necessary ☐ Other (specify) ☐ Specify: I don't know ☐ No response ☐
4.	**Okuva lwewasembayo okubuzibwa mirundi emeka gye wayogerako n'omuntu okuva mu ntekateeka eno?** Since we last interviewed you, how many times have you talked to someone from the program (i.e., Solomon or Taiga)?	Enter number:
5.	**Wafunako obuzibu bwona ne simu nebukulemesa okufuna ebyokukola?** Did you ever have problems with the phone that prevented you from accessing (downloading, opening) the activities?	Yes ☐ No ☐ I don't know ☐ No response ☐
5a	[IF YES TO 5] **Buzibu ki bwewafuna?** What kind of problem(s)? [MULTIPLE RESPONSES ACCEPTED]	Hardware problem (phone not working) ☐ Download problem (phone works but audio doesn't work) ☐ Didn't receive the SMS notification ☐ I don't know ☐ No response ☐
5b	[IF YES TO 5] **Did you get them fixed?**	Yes ☐ No ☐ Some were fixed, others not ☐ I don't know ☐ No response ☐
5c	[IF YES TO 5] **Obuzibu obwo, wabuvuka ofya?** How did you get them fixed? [MULTIPLE RESPONSES ACCEPTED]	I talked to someone from the program ☐ I got help from someone else ☐ I figured it out myself ☐ Other ☐ I don't know ☐ No response ☐

6.	**Nga ogyeko ggwe, waliwo omuntu omulala eyali asomyeko no'mwana wo nga akozesa ebikolwa ebyokusimu?** Did anyone besides you ever use the mobile phone to conduct the mobile phone activities with your child assigned to the program?	Yes ☐ No ☐ I don't know ☐ No response ☐
6a.	[IF YES TO QUESTION 6] **Mbulira ani eyakola ebikolwa bino?** Please tell me who else conducted the activities. [TICK ALL RESPONSES PROVIDED.]	<u>The child's</u>: Mother - biological, adoptive, step ☐ Father - biological, adoptive, step ☐ Grandparent ☐ Aunt/Uncle ☐ Sister/Brother ☐ Friend ☐ Other adult living in the household ☐ Other adult NOT living in the household ☐ Other ☐ I don't know ☐ No response ☐

PART C: ABOUT PROGRAM PARTICIPATION (For PARTICIPANTS only)		
7.	**Wakola buli somo byewafuna n'omwana wo?** Did you do every lesson that you downloaded with your child?	Yes, every lesson ☐ Most ☐ Some ☐ I don't know ☐ No response ☐
8.	**Wakola buli kyakukola ekyali mumisomo gyewafuna?** Did you usually do all of the activities that the lesson suggested?	Yes, usually did all activities ☐ No, (sometimes did only partial lesson) ☐ I don't know ☐ No response ☐
8a.	[If NO to 8a] **Which activity did you do most often/regularly?**	Learn a letter sound ☐ Match the letter to the phone keys ☐ Think of words that start with the same letter ☐ Learn a word ☐ Listen to a story ☐ Answer questions about the story ☐ I don't know ☐ No response ☐

9.	**Mbulira lwaki tewakola ebimu kubikolwa no'mwana wo?** If you downloaded a lesson but did not do it [all activities or some activities] with your child, please tell me why. [DO NOT READ OPTIONS. SELECT THE OPTIONS THAT MOST CLOSELY MATCHES THE MOTHER'S RESPONSE. MULTIPLE RESPONSES ACCEPTED]	Someone else did the activities with my child ..... ☐ I did not have time ..... ☐ I did not understand what I was supposed to do . ☐ My child did not have time ..... ☐ My child was not interested ..... ☐ Material too difficult ..... ☐ I/my child did not find them interesting/fun ..... ☐ I/my child did not understand the audio/SMS ..... ☐ Mobile phone lost, damaged or stolen ..... ☐ Mobile was not charged ..... ☐ I was sick or injured ..... ☐ My child was sick or injured ..... ☐ I was away from home/my child ..... ☐ Technical problems (sound, readability) ..... ☐ Other ..... ☐ Specify: I don't know ..... ☐ No response ..... ☐
10.	**Mukutwaliza awamu, mirundi emeka gyewakola omulimu gwo'kusoma no'mwana wo?** On average, how often did you do activities with your child? [SUGGEST OPTIONS ONLY IF THEY ARE HAVING TROUBLE RESPONDING. ONLY TICK ONE OPTION.]	1 time per week ..... ☐ 2 times per week ..... ☐ 3 times per week ..... ☐ 4 times per week ..... ☐ 5 times per week ..... ☐ 6 times per week ..... ☐ Every day, including Sunday ..... ☐ More than once per day ..... ☐ I don't know ..... ☐ No response ..... ☐
11.	**Biseera ki mu lunaku byewasinga okukola omulimu gwo'kusoma n'omwana wo? Kumakya, mutuntu, oba olwegulo?** At what time of the day did you most frequently do the activities with your child ? In the morning, the afternoon or the evening?	In the morning ..... ☐ In the afternoon ..... ☐ In the evening ..... ☐ I don't know ..... ☐ No response ..... ☐
12.	**Wali ozemu ebikolwa byewali omaliriza okuwuliriza?** Did you ever repeat a lesson that you had already listened to once?	Yes ..... ☐ No ..... ☐ No response ..... ☐
12a.	[IF NOT "YES" to above] **Wali omanyi okuddamu amasomo agayise?** Did you know how to repeat previous lessons?	Yes ..... ☐ No ..... ☐ No response ..... ☐

13.	**Wakola ko emisomo gy'okusimu n'omwaana omulala yenna?** Did you do the audio lessons with anyone other than your child?	Yes ☐ No ☐ No response ☐
13a	[IF YES TO QUESTION 13] **Wagikola n'abaana ki abalala?** With whom did you do the audio lessons?	Other children in the household ☐ Other children outside the household ☐ No response ☐
13b	[IF YES TO QUESTION 13] **Wagikola n'abaana bameka abalala?** How many other children?	Enter number:
13c	**Walagako omuntu omulala yenna obubaka buno nga ogyeko omwana wo?** Did you share the SMS download link with anyone else?	Yes ☐ No ☐ No response ☐
14.	**Amasomo ga buli wiki gaali tegamala, gaali gamala oba gaali mangi nyo?** Was the number of lessons per week not enough, about right or too many?	Not enough ☐ About right ☐ Too many ☐ I don't know ☐ No response ☐

PART D: QUESTIONS ABOUT PROGRAM CONTENT (FOR PARTICIPANTS ONLY)		
15.	**Ggwe oba omwana wo mwafunako obuzibu okutegeera ebyokukola byemwakopolola?** Did you or your child ever have problems <u>understanding</u> the audio activities that you were able to download?	Yes ☐ No ☐ I don't know ☐ No response ☐
15a.	[IF YES TO QUESTION 15] **Mbulira lwaki temwabitegeera?** Please tell me why you could not understand the audio clips. MULTIPLE RESPONSES ACCEPTED	Sound quality poor ☐ Do not understand Lugandan ☐ Vocabulary or accent different than mine ☐ Other ☐ Specify: I don't know ☐ No response ☐

16.	**Kyakukola ki omwana wo kyeyasinga okunyumirwa?** Which activity did your child enjoy the most? [Choose one]	Learn a letter sound ☐ Match the letter to the phone keys ☐ Think of words that start with the same letter ☐ Write the letter/word ☐ Learn a word ☐ Listen to a story ☐ Answer questions about the story ☐ I don't know ☐ No response ☐
17.	**Kyakukola ki omwana wo kyeyasinga obutanyumirwa?** Which activity did your child enjoy the least?	Learn a letter sound ☐ Match the letter to the phone keys ☐ Think of words that start with the same letter ☐ Learn a word ☐ Listen to a story ☐ Answer questions about the story ☐ I don't know ☐ No response ☐
18.	**Okuva lwewatandika okwetaba muntekateeka yokuyiga okusoma, oyinza okugamba nti: osobola bulungi okuyamba omwanawo okuyiga okusoma oba tosobolerako ddala kuyamba mwanawo kuyiga kusoma?** Since you started the mobile phone program, would you say you are: Better able to help your child learn to read or not any better able to help your child learn to read?	Better able to help my child learn ☐ Not better able to help my child learn ☐ I don't know ☐ No response ☐
18a.	[IF REPORTS BETTER ABLE TO HELP CHILD IN QUESTION 18] **Mbulira ngeri ki entekateeka eno gyeyakuyambamu okuyamba omwanawo okuyiga okusoma.** Please tell me how the program helped you to help your child learn to read. [MULTIPLE RESPONSES ACCEPTED]	Provided activities/games for me to do with my child ☐ Helped me learn to read myself ☐ Helped me understand what is important in the process of learning to read ☐ Showed me how I can use a household object to promote reading ☐ Other: ☐ Specify I don't know ☐ No response ☐
19.	**Mubiseera ebijja mumaaso, bwonooba olina omwana mu P1 oba P2 wandyagade okukozesa entekateeka eno naye?** In the future, if you have another child in P1 or P2 would you want to use the program with them?	Yes ☐ No ☐ I don't know ☐ No response ☐

19a.	[If yes] **Osobola okukozesa entekateeka eno omulundi omulala singa olina okusasulira obubaka bwemisomo egyo kusimu?** Would you use it again if you had to pay to receive the audio lesson?	Yes ☐ No ☐ I don't know ☐ No response ☐
19b.	[if yes] **Sente meka ezisingayo obungi zoyinza okusasulira obubaka bwemisomo egyo kusimu.** What is the maximum amount you would be able to pay to receive the audio lesson?	Less than 500sh ☐ 501-1000 sh ☐ 1001-2000 sh ☐ 2001-3000 sh ☐ 3001-4000 sh ☐ 4001-5000 sh ☐ 5001-6000 sh ☐ More than 6000 sh ☐ I don't know ☐ No response ☐
20.	**Oyinza okusemba mukwano gwo okukozesa entekateeka eno? Mpa endowooza yo mubwesimbu.** Would you recommend the mobile phone program to a friend or relative [if it were free]? Please give your honest opinion.	Yes ☐ No ☐ I don't know ☐ No response ☐
20a.	[IF *NO* TO QUESTION 20] **Lwaki toyiza kusemba ntekateeka eno?** Why would you NOT recommend the program? [DO NOT READ OPTIONS. SELECT THE OPTIONS THAT MOST CLOSELY MATCHES THE RESPONSE. YOU MAY TICK MULTIPLE OPTIONS.]	Takes too much time ☐ Child not interested ☐ Material too difficult ☐ I/my child did not find program useful ☐ My child's reading did not improve ☐ I/my child did not understand the SMS/audio ☐ Mobile phone problems [hardware, responsibilities, functioning, etc.] ☐ Network access problematic [network poor, unavailable, download issues. etc.] ☐ Other [please specify] ☐ Specify: I don't know ☐ No response ☐
21.	**Olowooza entekateeka eno tuyinza kugirongosa tutya?** How would you suggest we improve the program?	Enter response:

PART E: ENGAGEMENT IN READING QUESTIONS (FOR ALL)

Weebale nnyo. Tweyongereyo.

Webale nnyo . Mukitundu ekidako, ngenda kukubuuza ku bimu ku bikolwa byemuyinza okuba nga mwetabamu no'mwana wo ewaka wo.

Thank you so much for the information. In this next part of our interview, I'm going to ask you about some activities you may have done with children in your home.

Ngenda kukusomera ku bimu ku bintu byoyinza okubeera nabyo mumaka go. Nkusaba ombulire oba olina ebintu bino. Bwoba obilina, biri mululimi ki?

First, I'm going to read to you a list of items you might have in your home. Please tell me if you have the item. If you have the item in your home, please tell me in which language the material is written.

22.	**Okuva lwewasembayo okubuzibwa wali ofunyeyo kubyo'kusoma ebipya ewaka wo?** Since you were last interviewed, have you acquired any new reading materials (print) in your home?	Yes ☐ No ☐ I don't know ☐ No response ☐
22a.	[IF YES TO 22] **Bintu ki ebyo'kusoma byolina?** What type of reading materials?	Story books for children besides school books ☐ Children's chool books ☐ Novels or other books for adults ☐ Religious books like the bibile ☐ A dictionary ☐ Newspapers ☐ Other ☐ I don't know ☐ No response ☐
22b.	[IF YES TO 22] **Biri mululimi ki?** In what language?	English ☐ Luganda ☐ Some of each language ☐ Other ☐ I don't know ☐ No response ☐
23.	**Ngenda kukusomera ebikolwa ebiwerako. Nkusaba ombulire oba wabikolako no'mwana wo asoma wano mu pulayumale esooka oba eyokubiri mu wiiki eyise.** I'm going to read you a list of activities. Please tell me if you have done these activities *during the past week with your [say name]* Have you:	
	a) Wabulira ku mwana wo olugero? …Told your child a story?	Yes ☐ No ☐ Don't know/No response ☐
	b) Wabuuza omwana wo ebibuuzo ebikwata ku lugero? …Asked your child questions pertaining to a story?	Yes ☐ No ☐ Don't know/No response ☐

	c) Mwazanyako ku mizanyo gye bigambo oba wagamba ko ku mwana wo ekyikokyo/ekitontome? …Played word games or told your child a riddle?	Yes..... ☐ No ..... ☐ Don't know/No response..... ☐
	d) Wasomesako omwana wo ennukuta? …Taught your child letters?	Yes..... ☐ No ..... ☐ Don't know/No response..... ☐
	e) Wasomesesako ku mwana wo ebigambo? …Taught your child words?	Yes..... ☐ No ..... ☐ Don't know/No response..... ☐
	f) Wasomesesako ku mwana wo enyimba? …Taught your child songs?	Yes..... ☐ No ..... ☐ Don't know/No response..... ☐
	g) Wasomeramu omwana wo ku mboozi? …Read aloud to your child? [Note: How many times last week; and for how long (approximately, on average) each time]	Yes..... ☐ No ..... ☐ **IF YES**, mirundi emeka gwe oba omuntu omulala gye mwasomera mu omwana wo mu wiiki eyise (number):_____ **IF YES**, Gwe (oba omuntu omulala yenna ewaka ewamwe) bwe mwasomeramu omwana wo, banga ki lye mwa'mala nga mumusomera? Nkusaba obulire edakiika zenyini zemwamala. (minutes): _____ Don't know/No response..... ☐
	h) Omwana wo wamusaba okukusomeramu emboozi? …Asked your child to read aloud to you?	Yes..... ☐ No ..... ☐ Don't know/No response..... ☐
	i) Wali oyogedeko n'omwana wo ku byeyakola ku ssomero? ….Talked to your child about what s/he did at school?	Yes..... ☐ No ..... ☐ Don't know/No response..... ☐
	j) Wali owade ku mwana wo ebitabo oba ebikozesebwa ebirala ebyo'kusoma? …Provided your child with books or other reading materials?	Yes..... ☐ No ..... ☐ Don't know/No response..... ☐
	k) Wali osomye ko ku bubaka bwo ku simu no'mwana wo? …Read an SMS message with your child?	Yes..... ☐ No ..... ☐ Don't know/No response..... ☐

	l) Wali osabye ku muntu yenna okuyamba omwana wo okusoma ennukuto oba ebigambo? …Asked someone to help your child with letters or words?	Yes ☐ No ☐ Don't know/No response ☐
24.	**Mirundi emeka omwana wo ali mu P.1/P.2 gye'yegezamu okukusomera ennukuta oba ebigambo oba okusomera omuntu yenna omulala ewaka wamwe mu wiiki eyise?** How often did your child in P1/P2 practice reading letters or words to you or to someone else in your home in the past week?	Never ☐ 1 or 2 times ☐ 3 or 4 times ☐ 5 or 6 times ☐ Every day ☐ Don't know/No response ☐
25.	**Mirundi emeka YENNA ku baana bo gye yegezamu okusomera ennukuta oba ebigambo oba okusomera omuntu omulala yenna ewaka wo mu wiiki eyise?** How often did ANY of your children practice reading letters or words to you or to someone else in your home in the past week?	Never ☐ 1 or 2 times ☐ 3 or 4 times ☐ 5-6 times ☐ Every day ☐ Not applicable (only 1 child) ☐ Don't know/No response ☐
26.	**Olowooza omwana yandibadde mukibiina ki okusobola okusoma ebigambo ebyangu mu luganda?** By the end of what grade do you think a child should be able to read simple words in Luganda?	Never (not possible/useful) ☐ Earlier than P1 ☐ P1 ☐ P2 ☐ P3 ☐ P4 ☐ Higher than P4 ☐ Don't know/No response ☐

PART F: QUESTIONS ABOUT THE CHILD (FOR ALL)		
	Webale nnyo. Kyenkana tunatera okumaliriza! Kamalirize okubuuzibwa kwaffe nga nkubuza yo ebibuuzo bitonotono ebikwata ku mwana wo ali mu kibiina ky'oluberyeberye. Thanks for the information. We're almost done! Let me end our interview by asking just a few questions about your child who is in Primary 1.	
27.	**Omwana wo yayosa emirundi egisuka mwe'taano term eyaggwa?** Was your child absent from school more than 5 days last term?	Yes ☐ No ☐ Don't know/No response ☐
28.	**Omwana wo amanyi amaloboozi g'ennukuta za walifu yo Luganda?** Does your child know the sounds of the letters of the Luganda alphabet?	Yes ☐ No ☐ Don't know/No response ☐

29.	**Omwana wo amanyi amaloboozi g'ennukuta za walifu yo luzungu?** Does your child know the sounds of the letters of the English alphabet?	Yes ☐ No ☐ Don't know/No response ☐
30.	**Omwana wo alina ebitabo ebyetagisa okuyiga oluganda?** Does your child have the required school books for learning Luganda?	Yes ☐ No ☐ Don't know/No response ☐
31.	**Mu term eyayita, omwana wo yaleeta ko ewaka ebitabo bye okuva ku ssomero wakiri omulundi gumu?** Last term did your child bring home his or her books from school at least one time?	Yes ☐ No ☐ Don't know/No response ☐

WERE DONE! THANKS SO MUCH FOR YOUR PARTICIPATION.

	Time the interview ended	Assessor's initials

Weebale nnyo. Tweyongereyo.

Annex D: Student Instrument

Same disclaimers apply (see Annex C: Parent Instrument)

Early Grade Reading Assessment – Luganda Assessor Instructions & Pupil Protocol
MobiLiteracy Endline Assessment MOBILES GROUP September 2013

General Instructions:

It is important to establish a playful and relaxed rapport with the children to be assessed via simple initial conversation on topics of interest to the child (see examples below). The child should perceive the following assessment almost as a game to be enjoyed rather than a severe situation. It is important to read ONLY the Subtasks in boxes aloud slowly and clearly.

Oli otya_____? Nze _____ era mbeera _____. Njagala okukutegeeza ebimu ku bintu ebinkwatako. [For example, number and ages of children; sports.] **1. Oyinza okumbuulira ebimu ku bintu ebikukwatako awamu n'abantu b'obeera nabo ewammwe?** [Wait for response; if the child is reluctant, ask question two, but if she/he seems comfortable continue to verbal consent]. **2. Biki by'otera okwagala okukola bw'oba toli ku ssomero?**

Verbal Agreement

Ojjukira emyezi mitono egiyise omuntu bweyaja nayogera namwe kubikwata ku byokusoma? Ne leero tugenda kukola ekintu kyekimu. Do you remember a few months ago someone came to talk to you about reading? **We are going to do the same thing again today. Ka nkubuulire lwaki nzize wano leero. Nkolera wamu ne'ekitongole ekimu era nga tugezaako okutunuulira engeri abaana gye bayigamu okusoma. Walondeddwa mu ngeri ya kalulu.** I work with a group of organizations that is trying to understand how children learn to read. **Gwe n'omuzadde wo mwewayo okwetaba mu ntekateka ey'okusoma njagala kumanya engeri entekateka eno gyebadde ey'omugaso gye muli.** You and your family member volunteered to be part of a reading program. I'd like to find out how useful that program was for you.

- **Twandyagadde otuyambeko mu nsonga eno gye tuliko. Naye tetukukaka kwetaba mu kunoonyereza kuno bw'oba toyagala.**
- We would like your help in this. But you do not have to take part if you do not want to.
- **Tugenda okuzannyayo akazannyo ak'okusoma. Nŋenda kukusaba osome amaloboozi, ebigambo awamu n'emboozi ennyimpi mu ddoboozi eriwulikika obulungi.**
- We are going to play a reading game. I am going to ask you to read letters, words and a short story out loud.
- **Nga neeyambisa akuuma kano, ŋŋenda kulaba ekiseera ky'onoomala ng'osoma.**
- Using this device, I will see how long it takes you to read.
- **Kino si kigezo n'olwekyo teweeraliikirira.** This is NOT a test and it will not affect your grade at school
- **Nja kukubuuza ku binti bye muyinza okuba nga mwakolako nabamumaka gyova.** I will also ask you other questions about things you may have done with your family in the past.
- **Sijja kuwandiika linnya lyo era teri n'omu ajja kumanya by'ogenda okumbuulira**. I will NOT write down your name so no one will know these are your answers.
- **Nziramu okukujjukiza nti bw'oba toyagala kwetaba mu kunoonyereza kuno tokakibwa. Ne bwe tuba tutandise n'owulira nga waliwo ekibuuzo ky'otoyagala kuddamu, okireka.** 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.
- **Olina ekibuuzo kyonna kye wandy'agadde okumbuuza? Okkirizza okwetaba mu kazannyo kano? Kale katutandike.** Do you have any questions? Are you ready to get started?

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

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

A. Date of Assessment:	|___|___| day	|___|___| month	|___|___| year

PARENT CODE:

B. Assessor's Name:	
C. GROUP	○ Mobile
D: Parish	
E. School Name:	
F. Class:	○ 1 = P1 2 = P2

Student Code:	
G: Class name (stream)	
H. Pupil Birth Month (if available)	|_____|_____|
I. Pupil Birth Year (if available)	|_____|_____|
J. Pupil's Gender:	○ 1 = boy ○ 2 = girl
Time:	Start |____|____|: |___|___| Finish |___|___|: |___|___|

▪ Subtask 1. Letter Sound Knowledge

Show the child the sheet of letters in the pupil stimuli booklet. Say,

Olupapula luuluno okuli ennukuta za walifu. Mbuulira amaloboozi g'ennukuta zonna z'omanyi—njagala MALOBOOZI gaazo so ssi MANNYA.

Ekyokulabirako, eddoboozi ly'ennukuta /a/ [point to the letter "a"] **liri /a/.**

Katwegezeemu: mbuulira eddoboozi ly'ennukuta eno [point to the letter "v"]**:**
[If the child responds correctly, say**:**] **Kirungi, eddoboozi ly'ennukuta eno liri /v/.**
[If the child does not respond correctly, say:] **Eddoboozi eryo liri /v/.**

Kati gezaako eno: mbuulira eddoboozi ly'ennukuta eno [point to the letter "L"]:
[If the child responds correctly, say:] **Kirungi, eddoboozi ly'ennukuta eno liri /l/.**
[If the child does not respond correctly, say:] **Eddoboozi ly'ennukuta eno liri /l/.**

Bwe ŋŋamba nti "tandika", tandikira wano [point to first letter] **okutandikira ku olusooka. Songa ku buli nnukuta ombulire eddoboozi ly'nnukuta eyo.** [Point to the first letter on the row after the example and draw your finger across the first line].**Soma mu bwangu ddala nga bw'osobola ate n'obwegendereza nga otandikira ku lunyiriri olusooka. Genda ku nnukutta edako singa osanga e'nnukuta nga togimanyi. Songa ku nnukuta esooka. Weetegese? Tandika.**

Start the timer when the child reads the first letter.

- Follow along with your pencil and clearly mark any incorrect letter sounds with a slash (/).
- Count self-corrections as correct. If you already marked the self-corrected letter sound as incorrect, circle it (ø) and continue.
- If the pupil skips an entire line, ~~draw a line through it on the protocol~~.
- Stay quiet, except if the pupil hesitates for 3 seconds. Point to the next letter and say, "**Genda mu maaso**". Mark the skipped letter wrong.
- If the child gives you the letter name, rather than the sound, provide the letter sound and say: "**Mbulira eddoboozi ly'ennukuta.** This prompt may be given only once during the subtask.
- **Early stop rule:** If you have marked as incorrect all of the answers on the first line with no self-corrections, say **"Weebale nnyo!",** discontinue this subtask, check the box at the bottom, and continue to the next subtask.

AFTER 60 SECONDS SAY, "Lekera awo." Mark the final letter sound read with a bracket ( ]).

1	2	3	4	5	6	7	8	9	10	
u	A	P	L	W	U	M	R	i	a	*(10)*
h	J	y	A	m	E	T	b	K	ŋ	*(20)*
i	A	G	A	t	I	W	n	a	U	*(30)*
k	G	A	b	e	A	L	i	N	A	*(40)*

Weebale nnyo. Tweyongereyo.

b	Y	O	M	E	a	N	g	A	S	*(50)*
U	E	a	o	C	A	m	u	K	o	*(60)*
E	B	u	v	I	w	n	a	T	m	*(70)*
k	B	F	u	N	A	L	ny	O	a	*(80)*
d	N	k	z	A	e	g	ŋ	O	I	*(90)*
A	Y	W	O	r	n	E	A	N	a	*(100)*

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

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

Subtask 2. Syllable Segmenting

This is NOT a timed subtask and **there is not a pupil stimuli.**

Remove the pupil stimuli booklet from the child's view. Say,

Ekyokukola kino kya kuwuliriza. Njagala omenye ennyingo eziri mu buli kigambo. Ekyokulabirako, mu kigambo "muti" mulimu ennyingo zino "mu" ne "ti". Mu kyokukola kino njagala omenye ennyingo z'owulira mu buli kigambo. Buli kigambo nja kukyatula emirundi ebiri. Wuliriza ekigambo kino, n'oluvannyuma omenye ennyingo ezirimu.

Ka twegezeemu tulabe. Nnyingo ki eziri mu kigambo "gema"? "gema"?

[If the child responds correctly, say:]**: Kirungi nnyo, ennyingo eziri mu kigambo "gema" ziri "ge" ne "ma".** [The child DOES NOT need to say the word "ne" between the syllables.]

[If the child does not respond correctly, say]: **Ennyingo eziri mu kigambo "gema" ziri "ge" ne "ma".**

Kati ka tufuneyo ekyokulabirako ekirala: nnyingo ki eziri mu kigambo "taata"? "taata"?]

[If the child responds correctly, say]**: Kirungi nnyo, ennyingo eziri mu kigambo "taata" ziri "taa" ne "ta".**

[If the child does not respond correctly, say]: **Ennyingo eziri mu kigambo "taata" ziri "taa" ne "ta".**

Kale, katutandike. Nja kusoma ekigambo emirundi ebiri. Kiwulirize bulungi, oluvannyuma ombuulire ennyingo eziri mu kigambo ekyo. Otegedde eky'okukola?

- Pronounce each word slowly. Do not break the word into individual syllables.
- Only say each word twice.
- If the child gives you the word, rather than the syllable, provide the syllable and say: "**Mbuulira ennyingo**" This prompt may be given only once during the subtask.
- Put a slash (/) through each INCORRECT syllable.
- If the child has not responded after 3 seconds, mark all the syllables as incorrect and proceed to the next word.

Early stop rule: If a child gives no correct answers among the first five words, say, "**Weebale nnyo!"** discontinue this subtask, check the box at the bottom of the page, and continue to the next subtask.

Nnyingo ki eziri mu kigambo "_____"? "_____"? [Say each word twice]					
				All Correct	**No Response**
bali	ba	li			
wano	wa	no			
lumu	lu	mu			
kutu	ku	tu			
weta	we	ta			*(5 words)*

mukazi	mu	ka	zi		
bazina	ba	zi	na		
sapatu	sa	pa	tu		
akati	a	ka	ti		
kabaka	ka	ba	ka		

Check this box if the subtask was discontinued because the child had no correct answers in the first five words. ☐

Subtask 3. Familiar Word Reading

Show the child the sheet of non-words in the pupil stimuli booklet. Say,

Waliwo wano ebigambo . Njagala osome bingi nga bw'osobola. Ebigambo bino tobigattulula wabula bisome busomi. Okugeza , ekimu ku bigambo bino kye kino: "ndiga"

Ka twegezeemu tulabe: soma ekigambo kino [point to the word: **mbaata**].
[If the child responds correctly**]: Kirungi, kino ekigambo kisomebwa: "mbaata"**
[If the child does not respond correctly, say]: **Kino ekigambo kisomebwa "mbaata."**

Kati ka tufuneyo ekyokulabirako ekirala: Soma ekigambo kino [point to the next word: **feeza**].
[If the child responds correctly, say]: **Kirungi, kino ekigambo kisomebwa "feeza".**
[If the child does not respond correctly say]: **Kino ekigambo kisomebwa "feeza"**

Bwe ŋŋamba nti "tandika", tandikira wano [point to first word] **okutandikira ku lunyiriri olusooka. Songa ku buli kigambo okisome.** [Point to the first word on the row after the example and draw your finger across the first line]. **Soma mu bwangu ddala nga bw'osobola ate n'obwegendereza. Genda ku kigambo ekidako singa osanga ekigambo kyo'tomanyi . Songa ku kigambo ekisooka. Weetegese? Tandika.**

- This is NOT a timed task and there is NOT an auto-stop rule. The child will attempt to read all words.
- Follow along with your pencil and clearly mark any incorrect words with a slash (/).
- Count self-corrections as correct. If you already marked the self-corrected word as incorrect, circle it (ø) and continue.
- If the pupil skips an entire line, ~~draw a line through it on the protocol~~.
- Stay quiet, except if the child hesitates for 3 seconds. Then point to the next word, and say, "**Genda mu maaso**."

Examples: ndiga mbaata feeza

1	*2*	*3*	*4*	*5*	
ccuupa	ggali	njovu	menvu	engo	*(5)*
kisero	kyayi	nyonyi	kaapa	mbwa	*(10)*

Weebale nnyo. Tweyongereyo.

▪ Subtask 4. Non-Word Reading

Show the child the sheet of non-words in the pupil stimuli booklet. Say,

Waliwo wano ebigambo ebiyiiye. Njagala osome bingi nga bw'osobola. Ebigambo bino tobigattulula wabula bisome busomi. Okugeza , ekimu ku bigambo ebiyiiyiziddwa kye kino: "moki"

Ka twegezeemu tulabe: soma ekigambo kino [point to the next word: **suki**].
[If the child responds correctly]: "**Kirungi nnyo: "suki."**
[If the child does not respond correctly, say]: **Ekigambo kino ekiyiiye kiri "suki."**

Kati ka tufuneyo ekyokulabirako ekirala: soma ekigambo kino [point to the next word: **galu**].
[If the child responds correctly, say]: **Kirungi nnyo: "galu."**
[If the child does not respond correctly say]: **Ekigambo kino ekiyiiyiziddwa kiri "galu."**

Bwe ŋŋamba nti "tandika", soma ebigambo mu bwangu ddala nga bw'osobola ate n'obwegendereza. Soma ebigambo nga bwe biddiriŋŋana ku nnyiriri, ng'otandikira ku lunyiriri olusooka. Genda kukigambo ekidako singa osanga ekigambo kyo'tomanyi. Otegedde eky'okukola? Songa ku kigambo ekisooka. Weetegese? Tandika.

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 already marked the self-corrected word as incorrect, circle it (ø) and continue.
- If the pupil skips an entire line, ~~draw a line through it on the protocol~~.
- Stay quiet, except if the child hesitates for 3 seconds, point to the next word, and say, "**Genda mu maaso**."

AFTER 60 SECONDS, SAY **"Lekera awo."** 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 "**Weebale nnyo!"** discontinue this subtask, check the box at the bottom, and continue to the next subtask.

Examples: moki suki galu

1	*2*	*3*	*4*	*5*	
doku	feyo	mbiya	vera	mulu	*(5)*
peri	ngiru	adada	yofu	kugga	*(10)*
aka	banu	mukadi	nnyi	teno	*(15)*
mbiba	lakya	miripa	seyo	palu	*(20)*
amu	ngolu	zimuka	kyawu	liru	*(25)*
moku	gena	midda	geŋo	nuli	*(30)*
kalitu	lwaga	emmole	fuyo	yu	*(35)*
gwefu	moti	mwane	jjata	ntuba	*(40)*
ŋera	ama	njawi	awoto	motu	*(45)*
tuuki	ŋŋaamu	cava	dasa	nkobi	*(50)*

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

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

Weebale nnyo. Tweyongereyo.

▪ Subtask 5. Listening Comprehension

Remove the pupil stimuli booklet from the child's view. Say,

> **Njagala kukusomera emboozi nga nnyimpi omulundi gumu. Bwe nnaaba mmaze okugikusomera, nja kukubuuza ebibuuzo. Mwattu wuliriza n'obwegendereza. Oluvannyuma oddemu ebibuuzo bye nnaaba nkubuuzizza. Otegedde eky'okukola?**

- This is an untimed task.
- Read the entire passage *ONLY ONE TIME.*
- Ask all of the questions.
- Do not allow the child to look at the passage or the questions.
- Give the child 3 seconds to begin to answer each question. Mark the child's response, and continue to the next question.

Nalule ayagala nnyo okugenda ku somero. Taata we amugulira ekkalaamu nnyingi. Agenda ku somero buli lunaku. Oluusi abulira banne engero. Ku somero ayigayo ebintu bingi. Awandiika n'engero. Ayagala kubeera muwandiisi nga maama we.

Kati ddamu ebibuuzo bino,	**Correct**	**Incorrect**	**No Response**
Kiki Nalulue kyayagala enyo okukola? (*bitabo/okusoma ebitabo*)			
Kiki Nalule kyakola ku somero? (*ebintu bingi*)			
Lwaki taata na Nalule amugulira ekalamu nyingi? (*asobole okuwandiika engero; Asobole okubeera omuwandiigi nga maama we*)			

<u>Do not</u> read the English translation to the child.

Nalule likes going to school a lot. Her father buys her many pencils. She goes to school every day. Sometimes she tells stories to her friends. She learns a lot of things. She writes many stories. She wants to be a writer like her mother.

1. What does Nalule like to do? (go to school, tell stories, write stories)
2. What does Nalule do at school? (learns many things, tells stories to her friends, writes stories)
3. Why does Nalule's father buy her many pencils? (so that she can go to school, so that she can write stories)

Webale nnyo. Kakati ŋenda kukubuuza ebibuuzo ebikwata ku waka wamwe.

PUPIL QUESTIONNAIRE

PART A: GENERAL QUESTIONS
EKITUNDU A: EBIBUUZO EBY'AWAMU

1.	**Walide emmere olwa leero nga tonagya ku ssomero?** Did you eat before coming to school today?	No.....☐ Yes.....☐ Don't know/No response.....☐
2.	**Do you have the following materials at school?** [Read questions 2a (Luganda textbook) and 2b (English textbook) and check the box that corresponds to the answer]	

	No	**Yes**	**Don't know/No response**
2a) Olina ekitabo ekiwandiike mu luganda			
2b) Olina ekitabo ekiwandiike mu luzungu			

3.	**Mubeera ko n'ebiseera okusoma ebitabo mukiibina kyamwe oba mu kunganilo ly'ebitabo buli lunaku?** Do you have time to read books in your classroom or in your school library every day?	No .....☐ Yes .....☐ Do not know/No response.....☐
4.	**Otwala ko ebitabo by'okusoma ewaka okuva mu kibiina kyamwe oba mu kunganilo ly'ebitabo?** Do you bring home reading books from your classroom or from the school library?	No .....☐ Yes .....☐ Do not know/No response.....☐

PART B: READING PRACTICES AT HOME
EKITUNDU B: ENKOLA Y'OKUSOMA EWAKA

Kakati ŋenda kukubuuza ebibuuzo ebitonotono ebikwata ku bikolwa by'okusoma byoyinza okuba ng'okola n'omuntu ewaka. Bwoba tokola nga ko kubikolwa byenkubuuza, tewali buzibu. Ddamu ng'ogamba nti yee oba nedda.

Waliwo omuntu yenna ewaka wamwe eyali akoze ku bikolwa bino nawe?
Has anyone in the household ever done the following activities with you?

Waliwo omuntu yeena eyali…. Has anyone ever	**No**	**Yes**	**Don't know/No response**
5a) Akunyumiriza ko ku lugero? Told you a story			

5b) Akubuuziza ko ku bibuuzo ebikwata ku lugero? Asked you questions about the story they told you?			
5c) Azanye ko naawe akazanyo ke bigambo oba na'kubulira ekikokyo/ekitontome? Played word games with you or told you a riddle?			
5d) Akusomeseza ku nnukuta? Taught you letters?			
5e) Akusomeseza ku bigambo? Taught you words?			
5f) Akusomeseza ko okuyimba enyimba? Taught you to sing songs?			
5g) Akusomede ko emboozi? Read aloud to you?			
5h) Akusabye okumusomera emboozi? Asked you to read aloud?			
5i) Ayogedde ko nawe ku bye wakoze ku ssomero? Talked with you about what you did at school?			
5j) Akuwadeyo ku bitabo byokusoma oba ebintu ebirala ebisomebwa? Provided you with books or reading materials?			
5k) Akusomede ko ku bubaka bw'okusimu? Read an SMS message to you?			

6.	**Bantu ki abakozeko ekikolwa oba ebikolwa ebisuka mu kimu ku ebyo nawe?** Which of these people have done any of these activities with you? [Check as many boxes as applicable.]	Mother - biological, adoptive, step ☐ Father - biological, adoptive, step ☐ Grandparent ☐ Aunt/Uncle ☐ Sister/Brother ☐ Friend ☐ Other adult living in the household ☐ Other adult NOT living in the household ☐ Other ☐ Do not know/No response ☐
7.	**Mirundi emeka gy'ewegazamu okusoma ennukuta oba ebigambo eri omuntu yenna ewamwe?** How often do you practice reading letters or words out loud to someone at home? [Read options]	**Tekibangawo** (Never) ☐ **Olusi** (Sometimes) ☐ **Buli lunaku** (Every day) ☐ **Siimanyi/Teri kyakuddamu** (Don't know/No response) ☐

8.	**Mirundi emeka omuntu yenna ewamwe gya'kusomera mu?** How often does someone at home read to you? [Read options]	**Tekibangawo** (Never) ☐ **Olusi** (Sometimes) ☐ **Buli lunaku** (Every day) ☐ **Siimanyi/Teri kyakuddamu** (Don't know/No response) ☐
Kati ngenda kukubuuza ebibuuzo nga bikwata ku bintu byoyinza okuba nga wakola nesimu nga eno okuva lwewasembayo okubuzibwa ebibuuzo. Bwoba tokoze bino ebikolwa, tewali mutawaana. Ngamba bugambi nti yye oba nedda. Now I'm going to ask you some questions about some activities you may have done with a mobile phone like this one since the last time you were interviewed. [Show the child a mobile phone.] If you have not done the activities, that's OK. Just tell me yes or no.		
9a	**Wegezaamu amaloboozi ge'nukuta ng'okozesa amasomo ago kusimu?** Did you ever practice <u>letter sounds</u> from the mobile phone lessons?	No ☐ Yes ☐ Don't know/No response ☐
9b	**Wegezaamu okuwandiika ennukuta ng'okozesa amasomo ago kusimu.** Did you ever practice <u>writing letters</u> from the mobile phone lessons.	No ☐ Yes ☐ Don't know/No response ☐
10a	**Wegezaamu okusoma ebigambo ng'okozesa amasomo ago kusimu?** Did you ever practice <u>words</u> from the mobile phone lessons?	No ☐ Yes ☐ Don't know/No response ☐
10b	**Wegezaamu okuwandiika ebigambo ng'okozesa amasomo ago kusimu.** Did you ever practice <u>writing words</u> from the mobile phone lessons.	No ☐ Yes ☐ Don't know/No response ☐
11	**Wawuliriza engero nga okozesa amasomo ago kusimu?** Did you ever <u>listen to stories</u> from the mobile phone lessons?	No ☐ Yes ☐ Don't know/No response ☐

11a	[IF YES TO QUESTION 11] **Wayogerako ne maama wo (oba omuntu omulala yenna ewaka) kubikwata ku engero nga omaze okuziwuliriza?** Did you ever discuss the stories with your mother [or someone else in your house] after listening to them?	No..... Yes..... Don't know/No response.....
11c	[IF YES TO QUESTION 11] **Lugero ki olwasinga okukunyumira (oba osobola okumbulira ku lugero lwona lwewawulira?** What was your favorite story (or can you tell me about any of the stories you heard?)	Write key word of student's response, or check if no answer. Don't know/No response.....
IF NO to 9, 10 **AND** 11 above, skip to **Q 19**. If any one of the above is "Yes", go on to 11a/b or 12.		
12.	[SKIP SECTION IF NO TO 9, 10 AND 11] **Ani gwewasinga okukola naye bino ebikolwa byo kusimu?** With whom did you MOST OFTEN do the mobile phone activity(ies)? [ONE PERSON ONLY]	Mother - biological, adoptive, step ..... Father - biological, adoptive, step ..... Grandparent ..... Aunt/Uncle..... Sister/Brother ..... Friend..... Other adult living in the household..... Other adult NOT living in the household..... Other..... Specify: Do not know/No response.....
13	**Waliwo omuntu omulala yenna eyakola nawe bino ebikolwa byo kusimu?** Did anyone else ever do the mobile phone activity(ies) with you?	No: ..... Yes: ..... Do not know/No response:.....

13a	[If YES TO 13] **Muntu ki omulala eyakola bino ebikolwa naawe?** Who else did the activity(ies) with you? [MULTIPLE RESPONSES ALLOWED]	Mother - biological, adoptive, step ☐ Father - biological, adoptive, step ☐ Grandparent ☐ Aunt/Uncle ☐ Sister/Brother ☐ Friend ☐ Other adult living in the household ☐ Other adult NOT living in the household ☐ Other ☐ Do not know/No response ☐
14.	**Wakola ko bino ebikolwa weka?** Did you ever do the activity(ies) by yourself?	No: ☐ Yes: ☐ Do not know/No response: ☐
15.	**Mirundi emeka gyewakola bino ebikolwa? Tekibangawo, olusi, buli lunaku oba emirundi egisuka mu gumu buli lunaku?** How often did you do the activity(ies) with someone or by yourself? [Read options]	**Tekibangawo** (Never) ☐ **Olusi** (Sometimes) ☐ **Buli lunaku** (Every day) ☐ **Emirundi egisuka mu gumu buli lunaku** (More than once per day?) ☐ Don't know/No response ☐
16.	**Biseera ki mu lunaku byewasinga okolerengamu bino ebikolwa: Ku makya nga tonagenda ku somero, mu tuntu, olweggulo oba ekiro ?** What time of day did you usually do the activity(ies)? [Read each option]	**Ku makya nga tonagenda ku somero** (In the morning, before school): ☐ **Mu tuntu** (In the afternoon): ☐ **Olweggulo oba ekiro** (In the evening/night): ☐ Don't know/No response ☐
17.	**Ki kyewasinga okwagala kubikolwa byo kusimu?** What did you like best about the mobile phone activity(ies)?	Learning new letters: ☐ Learning new words: ☐ Listening to the stories: ☐ Spending time with my mother/other person: ☐ Doing something with the mobile phone: ☐ Did not like the mobile phone activities: ☐ Other: ☐ Specify: Do not know/No response: ☐

18.	**Wayogerako na'baana abalala mukibiina kyo kubikolwa byewakola nesimu?** Did you ever talk to other kids in your class about the activity(ies) in you did with the phone?	No: ..... Yes: ..... Do not know/No response:.....
19.	[IF NO TO QUESTIONS 9-11] **Lwaki tewakola bikolwa bino?** Why didn't you ever do the activity(ies)? [Check as many as applicable, use paper to qualify response as necessary]	Problem with phone: ..... Problem with message download : ..... We didn't know what we were supposed to do:..... There was no time: ..... Other: ..... Specify: I do not know..... No response:.....
20.	**Esimu eriwa kati?** Where is the phone now? [Use paper to qualify response as necessary].	Lost ..... At home or otherwise intact and not lost ..... Destroyed..... Used for other purpose ..... With my parent/caregiver who is here ..... Other: ..... Specify: I do not know..... No response:.....

Waliwo ekintu ekirala kyonna kyoyagala okungamba ku kyoyagala, kyotaayagala, oba engeri gyo'lowooza gyetuyinza okunyumisa ebikolwa ebyo'kusoma?

Is there anything else you want to tell me about what you like, didn't like, or how you think we could make the learning activities more fun for you? **Webale nnyo. Kakati oyinza okuddayo mu kibiina.** [Give child gift and ensure they get back to class.]

	Time the assessment and interview ended.							
			H	H	M	M	AM/PM	

Assessor's initials