FRIENDS OF MATÈNWA

MOTHER TONGUE BOOKS:
Learning to read in Haiti
Final evaluation

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ALL CHILDREN READING:
A GRAND CHALLENGE FOR DEVELOPMENT

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Final report based on Early Grade Reading Assessment ("EGRA") data for Project "Mother Tongue Books: Learning to read in Haiti"

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Background and Overview of Mother Tongue Book Project and its Evaluation

The basic intervention in the Mother Tongue Book ("MTB") project consists of children's production and classroom use of illustrated storybooks in Kreyòl. These books are created with the help of teachers as a collaborative effort. The stories are written based on the children's own experiences and their own story telling, with the children acting out the stories as the latter are read aloud in class. The book-writing process includes "Writer's workshop" sessions where students also produce journals alongside Mother Tongue Books. Another crucial part of the MTB project consists of interactive read-aloud sessions where teachers read aloud sample of texts and ask questions to the students at pre-programmed points. The read-aloud sessions are used in tandem with independent reading sessions, with teachers working with small groups, as needed. (For more details of the MTB approach, see the proposal "Mother Tongue Books: Learning to Read in Haiti," dated January 31, 2012.

In our previous report, dated March 13, 2013, we reported on the Early Grade Reading Assessment ("EGRA") data collected by Mrs. Vana Edmond from November 5, 2012 to January 2nd, 2013. Mrs. Edmond is a 4th-grade teacher at Lekòl Kominotè Matènwa ("LKM"),. For that initial report, she administered the EGRA test, as baseline assessment, to 218 pupils in six schools in La Gonave, LKM and 5 other schools—1 public (or "national") school and 4 private schools. We'll refer to these 5 schools as the "non-LKM" schools, with the LKM students serving as a positive control to help evaluate the MTB intervention.

The overall results from that baseline report were as follows, quoting from the background-and-overview and conclusion paragraphs of the baseline report:

> " [...] Our overall impression is that the reading levels of the students in the five schools are extremely low. Many children, even in the 2nd grade, seem unable to read any word at all. And there were two schools where almost every student was unable to read any word in a short story. [...] These data converge with the low averages in previous studies on reading and writing levels in Haiti.[2]

[1] I profusely thank Elena Geretti for her immense and gracious help with nearly everything having to do this project—and to my life... Nuriel also deserves thanks for patiently bearing with too many absences while hoping that I would "forget [my] passport one thousand times"...

[2] http://www.eddataglobal.org/documents/index.cfm/Policy%20Brief%20EGRA%20Haiti_corrected_05Jan2012.pdf?fuseaction=throwpub&ID=344

> [...] and require immediate remedial action. [...]
>
> [...] If applied adequately, MTB-based methods should help improve the reading levels of the five schools in our project. So we very much look forward to testing all the 1st and 2nd graders at LKM and, then, to the 2nd stage of evaluation—toward the end of the MTB project when we will be able to compare the reading levels of the current crop of 1st and 2nd graders in the five schools. By then, these students will be in the 2nd and 3rd grades respectively. ..."

The tables below (Tables 1a/b) summarize the results in that baseline report:

Table 1a: Overall results from baseline assessment (academic year: 2012–2013)[3]

	Letter-name knowledge (correct letter names/min)		Phoneme segmentation (correct answers/10)		Letter-phoneme correspondence (correct phonemes/min)		Familiar-word identification (correct words/min)	
School/Grade	1st	2nd	1st	2nd	1st	2nd	1st	2nd
BM	11.5	12	2.5	3	10	8	1	5
JV	5	12.5	0	0	4	7	0	2
LP	7	22	1	2	7	10	1	8
NM	4.5	11	0	2	5	8	0.5	3
VF	7	10	4	2.5	6	8	1	1.5
LKM	14.5	33	10	10	21.5	60	5	28

Table 1b: Overall results from baseline assessment (academic year: 2012–2013)

	Invented-word decoding (correct words/min)		Short-story reading (correct words/min)		Reading comprehension (correct answer/5)		Oral-story comprehension (correct answer/5)	
School/Grade	1st	2nd	1st	2nd	1st	2nd	1st	2nd
BM	0	1	0	0	0	0	3.5	4
JV	0	0.5	0	0	0	0	4	5
LP	0	4	0	4	0	0	4	5
NM	0	0	0	0	0	0	4.5	4
VF	0	0	0	0	0	0	4	4
LKM	0.5	21	0.5	31	0	2	5	5

[3] We use the following abbreviations for the schools, as in Table 2: Baptiste Mare-Sucrin: "BM"; Joli Verger: "JV"; La Pléïade: "LP"; École Nationale Mare-Sucrin: "NM"; Vision Fred: "VF"; Lekòl Kominotè Matènwa: "LKM."

Following the baseline assessment, the MTB project was expanded to the 5 non-LKM schools through an LKM-lead effort. The present, and final, report analyzes the updated EGRA data collected by Mrs. Edmond from the same pool of pupils (now in 2nd and 3rd grades) in June and July, 2014:

Table 2: Student enrollment in the final evaluation for each school in the project[4]

School Name	2nd graders	3rd graders	TOTAL
Baptiste Mare-Sucrin (BM)	9	8	**17**
Joli Verger (JV)	33	51	**84**
La Pléïade (LP)	30	22	**52**
École Nationale Mare-Sucrin (NM)	6	7	**13**
Vision Fred (VF)	12	12	**24**
Lekòl Kominotè Matènwa (LKM)	16	19	**35**
TOTAL	**106**	**119**	**225**

The final-evaluation results clearly show that the Kreyòl-based teaching methods of the MTB project have substantially increased the reading levels of the pupils in the 10 pilot classrooms in these rural schools in La Gonave. According to the baseline assessment, the LKM pupils performed at a much higher level than their counterparts in the five schools in the study. In contrast, the final-evaluation data show that the students in the five non-LKM schools have substantially caught up with their LKM counterparts in terms of their reading-and-writing levels.

As in the baseline assessment, the final-evaluation instrument is the Early-Grade Reading Assessment ("EGRA") developed by Research Triangle Institute (RTI).[5] The EGRA enumerator for the MTB project is Ms. Vana Edmond (LKM).[6] Vana was trained at a workshop organized by RTI as part of its "Tout Timoun Ap Li" (TOTAL) project, in October 2012.[7]

We now report on eight of the nine subtests of the EGRA instrument, exactly as we did for the baseline assessment—the explanatory paragraphs for each subtest below repeat their

[4] There are 14 data points from the online database whose identities could not be recovered. These losses are due to human error or to technological failure.
[5] http://www.rti.org/page.cfm?nav=528&objectid=E60C72B1-6190-49EF-918317C0BB7E464D , https://www.eddataglobal.org/reading/index.cfm, http://www.rti.org/pubs/bk-0007-1109-wetterberg.pdf , https://www.eddataglobal.org/documents/index.cfm?fuseaction=pubDetail&ID=444 , https://www.eddataglobal.org/countries/index.cfm?fuseaction=pubDetail&ID=445
[6] Unlike in the baseline assessment, I did not have any opportunity to supervise Ms. Edmond during the data collection for the final evaluation.
[7] http://haiti.usaid.gov/work/docs/education/120816_total_fs.pdf

analogues in the baseline report:[8]

(i) Letter-name knowledge
(ii) Phoneme segmentation
(iii) Letter-phoneme correspondence
(iv) Familiar-word identification
(v) Invented-word decoding
(vi) Short-story reading
(vii) Reading comprehension
(viii) Listening comprehension

(i) Results of Letter-Name Subtest (Figures 1a/b)

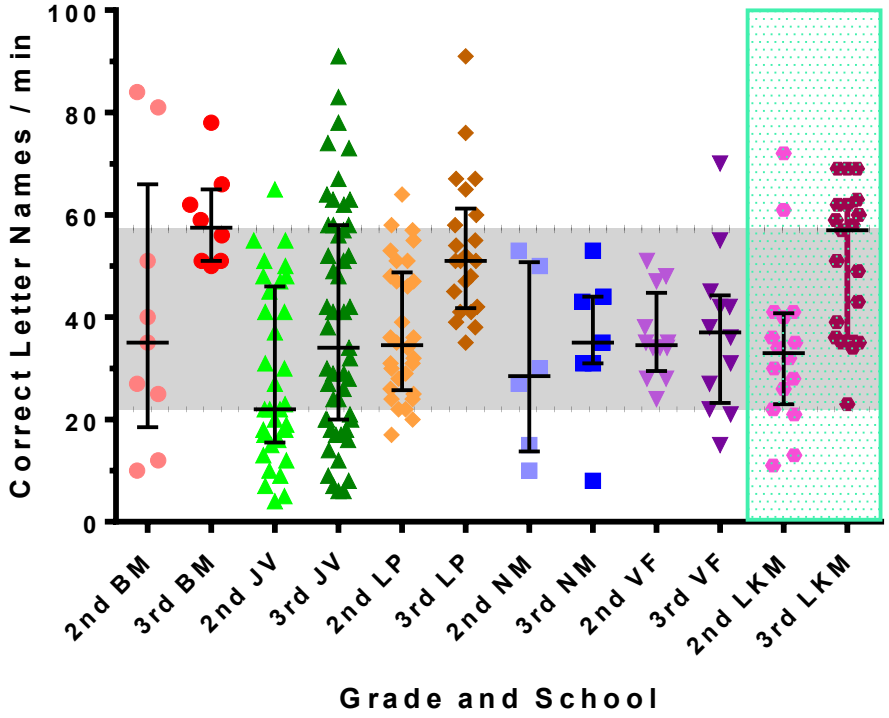
This part of the evaluation tests students' knowledge of letter names. The student is given a grid of 100 graphemes from the Kreyòl orthography, and is asked to identify the name of as many of these graphemes as possible. This is a timed test that lasts one minute. If the student goes through the entire minute giving answers (i.e., when the time remaining is 0 out of 60), the score (correct answers per minute) is the total of correct answers. If the student stops or is made to stop (after 10 consecutive mistakes—this is meant to avoid stress on the children) before reaching the one-minute mark or if the student goes through the entire grid in less than one minute, the score is calculated according to the following formula: x /(1-("time remaining" / 60)) where x is the number of correct answers and "time remaining" is the number of seconds remaining until the 60-second time mark. Similar formulas apply to other timed tests in the evaluation (letter-name knowledge, reading of familiar words, reading of unfamiliar words, short-story reading).

In the letter-knowledge subtest, the "Tangerine"-based[9] evaluation instrument on the table has an "autostop" feature that is activated (i.e., the subtest automatically stops) if the student gives incorrect answers for the first 10 items in the grid of stimuli.

[8] The dictation subtest, though it was administered, is not scored—a scoring formula has not yet been devised by RTI for this subtest.
[9] http://www.tangerinecentral.org

Figures 1a/b summarizes the results for this test across the five schools. In figure 1a, the data from the LKM students are shown in the rightmost and highlighted bar—LKM students are shown in such a highlighted bar in all the graphs below.

Figure 1a: Knowledge of letter names in 2014

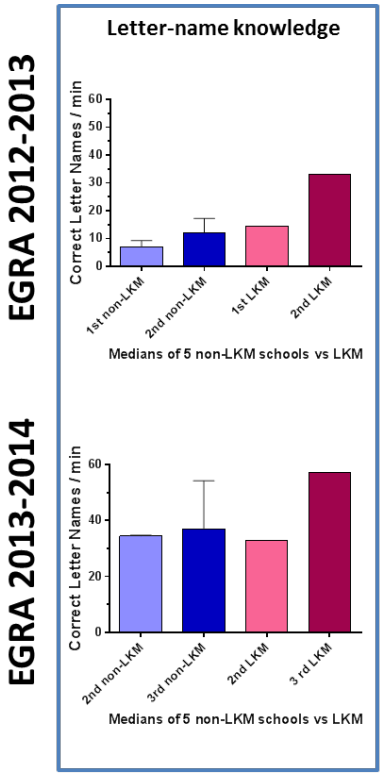


In this figure, the median scores[10] for the 2nd and 3rd graders in all the five non-LKM schools in 2013–2014 range between 22 to 57.5 correct letter names per minute (see grey shade in the graph). The medians for these very same cohorts in the preceding academic year (the 1st and 2nd graders in non-LKM schools in 2012–2013) had ranged from 4.5 and 22. A certain amount of progress from one year to the next is naturally expected given that the kids have matured and would have been expected to improve in any case. But what's most noteworthy in the above figure, keeping in mind the baseline data, is the fact that the 2nd graders in the 5 non-LKM schools in 2013–2014 now perform at approximately the same levels as their LKM counterparts even though the LKM pupils had performed much better than the non-LKM ones the preceding year. Indeed the LKM 2nd graders show a median of 33 correct letter names per minute whereas the 2nd graders in the 5 non-LKM schools show a median of 34.5. Such progress among the 2nd graders in the 5 non-LKM schools is shown

[10] As in the baseline, this report focuses on median (rather than average) scores because of the way that outliers can move average scores around with small group sizes such as the ones in this report. In figure 1b, as in figures 2b, 3b, 4b, 5b, 6b, 7b and 8b, the median shown for the 5 non-LKM schools is the median of their five medians.

in Figure 1b. In this figure and throughout the text below, the term "median of the 5 non-LKM schools" refers to the median of the 5 medians of these schools. As for the 3rd graders in the non-LKM schools, there's progress as well, but not as spectacular: 37 for non-LKM vs. 57 for LKM. This difference between the progresses of the younger vs. the older pupils is consistent across most of the subtests.

Figure 1b: LKM/non-LKM medians for letter-name knowledge from baseline to final

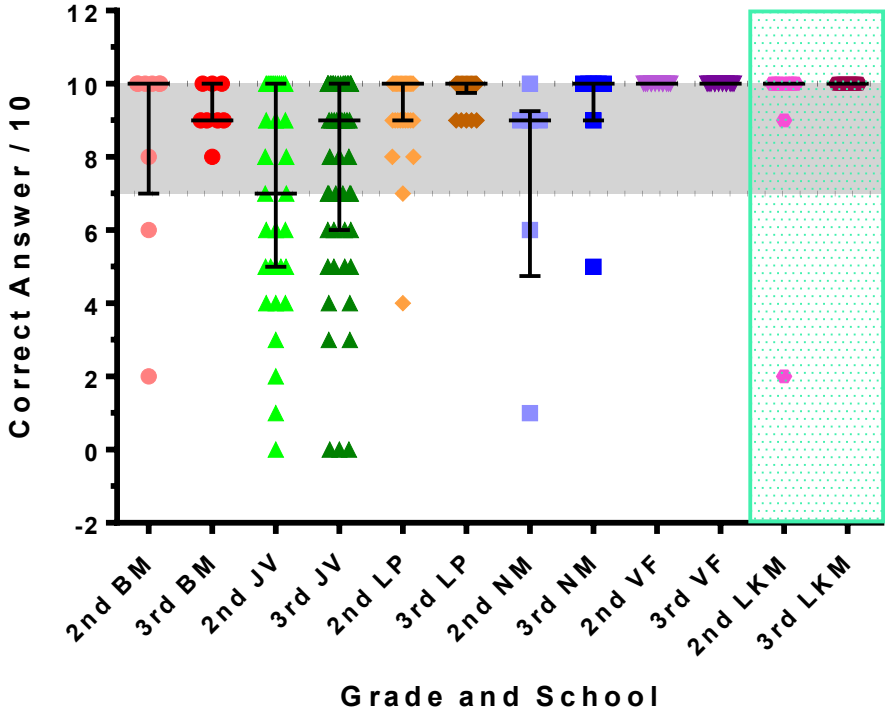


(ii) Results of Subtest on Phoneme Segmentation (Figures 2a/b)

In this subtest, students are asked to identify the initial phoneme (the onset of the 1st syllable) of 10 Kreyòl words. The student listens to the enumerator pronounce each word twice, and then the student has to pronounce the initial phoneme. For example, the initial phoneme in the Kreyòl word "soup" is /s/, and the student has to pronounce /sssss/. In this subtest, the Tangerine's autostop feature is triggered (i.e., the subtest stops) if the student gives incorrect answers for the first 5 words.

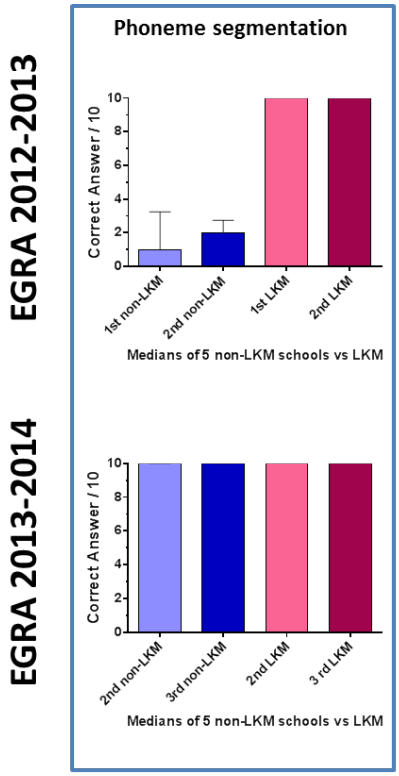
In Figure 2a, the median scores for the 2nd and 3rd graders in all the five non-LKM schools in 2013–2014 range between 7 and 10 correct answers out of 10 (see grey shade in the graph).

Figure 2a: Phoneme segmentation (identification of initial phonemes) in 2014



In the baseline assessment, this subtest and the next one (on letter-phoneme correspondences) were among the most difficult for 1st and 2nd graders in 2012–2013, for non-LKM students across all schools. In the non-LKM schools, the phoneme-segmentation subtest had median scores equal to 1 and 2 for the 1st and 2nd graders, respectively. (NB: By "median scores," we mean the medians of the 5 medians for each grade.) This is in stark contrast with the LKM students all of whom could give the right answers for all the 10 stimuli for this particular subtest on identifying the initial phoneme of words. But now, the non-LKM 2nd and 3rd graders in 2013–2014 are at the same levels as their LKM counterparts: all the pupils, in both groups (LKM and non-LKM schools) have perfect scores (i.e., 10/10) as summarized in Figure 2b.

Figure 2b: LKM/non-LKM medians for phoneme segmentation from baseline evaluation in 2013 to final evaluation in 2014

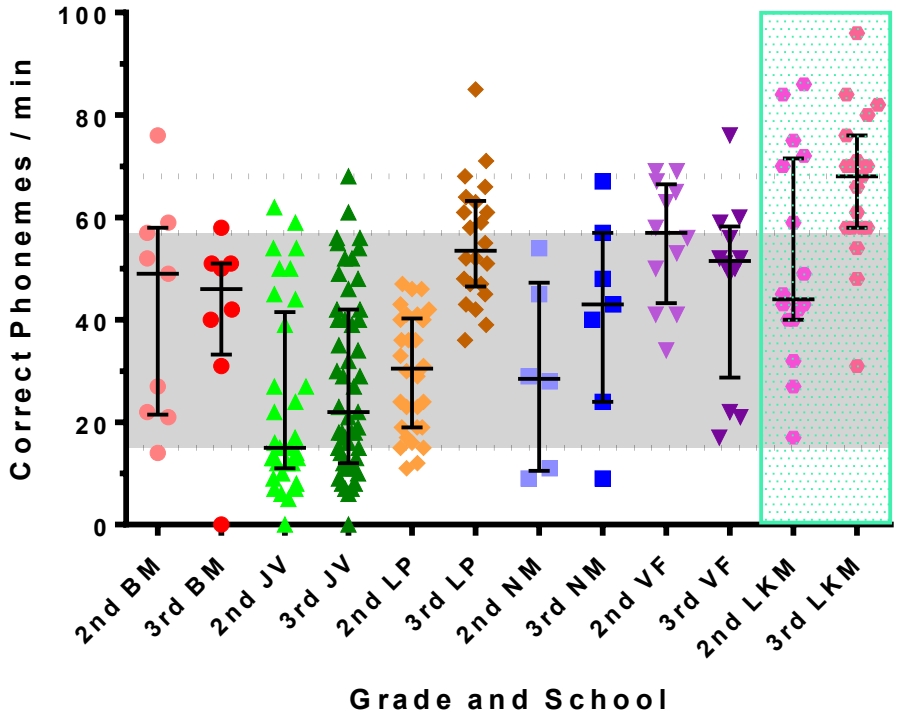


(iii) Results of Subtest on Letter-Phoneme Correspondence (Figures 3a/b)

This is another timed test (for 60 seconds, like all timed tests in EGRA) given a grid of 100 graphemes in the Kreyòl orthography. The student is asked to pronounce the phoneme associated with as many of these graphemes as possible. For example, the phoneme corresponding to the letter "m" is /m/ and the student must pronounce /mmmm/. In this test, the Tangerine's autostop feature is triggered (i.e., the subtest stops) if the student gives incorrect answers for the first 10 items in the grid of stimuli.

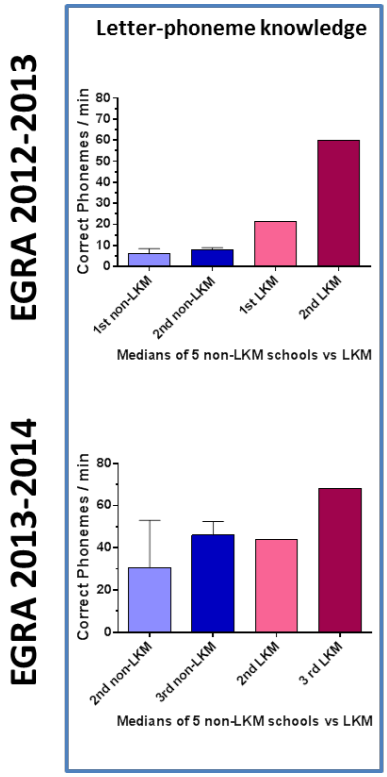
In Figure 3a, the median scores for the 2nd and 3rd graders in all the five non-LKM schools in 2013–2014 range between 15 and 57 correct phonemes per minute (see gray shade in the graph).

Figure 3a: Knowledge of letter-phoneme correspondence in 2014



In the baseline assessment, this subtest, like the previous subtest, was very difficult for the non-LKM students. In 2012-2013 there was a tendency for pupils in all five non-LKM schools to give, as answer, the letter names instead of pronouncing the phoneme associated with the letter. As a result, the median scores for the then 1st and 2nd grades for all the five non-LKM schools (i.e., the medians of the 5 medians for each grade) were 6 and 8 respectively whereas the median score for both the 1st and 2nd graders at LKM was 21.5 and 60 respectively. The contrast between 2012–2013 and 2013–2014 is clear: the 2nd and 3rd graders at non-LKM schools in 2013–2014 have median scores of 30.5 and 46 respectively, as compared to 44 and 68 for the 2nd and 3rd graders at LKM. This progress is schematized in Figure 3b.

Figure 3b: LKM/non-LKM medians for letter-phoneme correspondence from baseline evaluation in 2013 to final evaluation in 2014

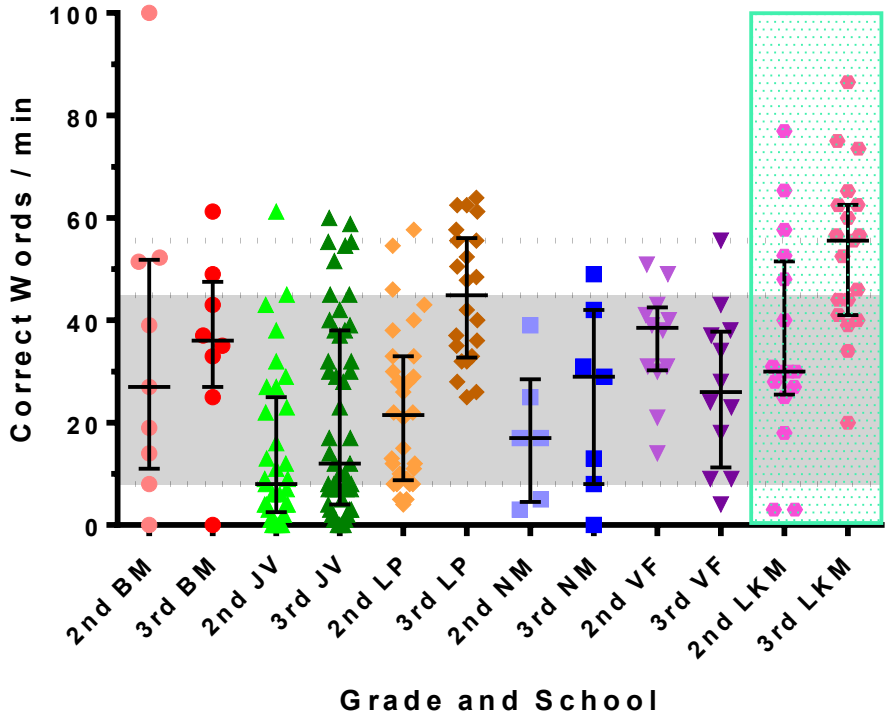


(iv) Reading of Familiar Words in 2014 (Figures 4a/b)

In this subtest, the student is asked to read each word in isolation from a sequence of 50 familiar words of relatively high frequency. In this test, the Tangerine's autostop feature is triggered (i.e., the subtest stops) if the student gives incorrect answers for the first 5 words.

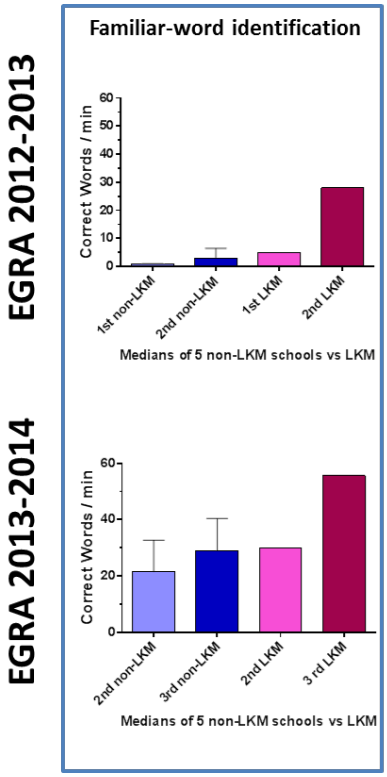
In Figure 4a, the median scores for the 2nd and 3rd graders in all the five non-LKM schools in 2014 range between 8 and 44.9 words per minute (see grey shade in the graph).

Figure 4a: Reading of familiar words in final evaluation (2014)



Back in 2012–2013, the results of the 1st and 2nd graders in the non-LKM schools were very low: 1 and 3 correctly-read words per minute, respectively, as compared to median scores of 5 and 28 for the 1st and 2nd graders at LKM. But, in 2013–2014, the medians for the 2nd and 3rd graders in the non-LKM schools (i.e., the medians of the 5 medians for each grade) have closed the gap vis-à-vis their LKM counterparts: 21.5 and 29 as compared to 30 and 55.56.

Figure 4b: LKM/non-LKM medians for familiar-word identification from baseline evaluation in 2013 to final evaluation in 2014

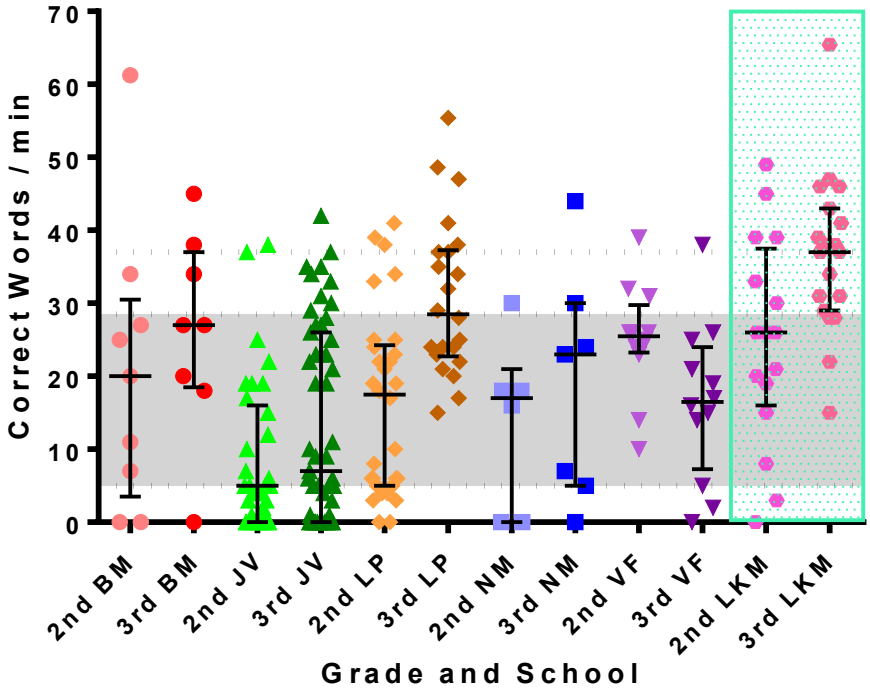


(v) Decoding of Invented Words (Figures 5a/b)

In this subtest, the student is asked to read each word in isolation from a sequence of 50 invented words which have been created in such a way that the student cannot rely on context or on memory for decoding the stimuli. In this subtest, the Tangerine's autostop feature is triggered (i.e., the subtest stops) if the student gives incorrect answers for the first 5 words.

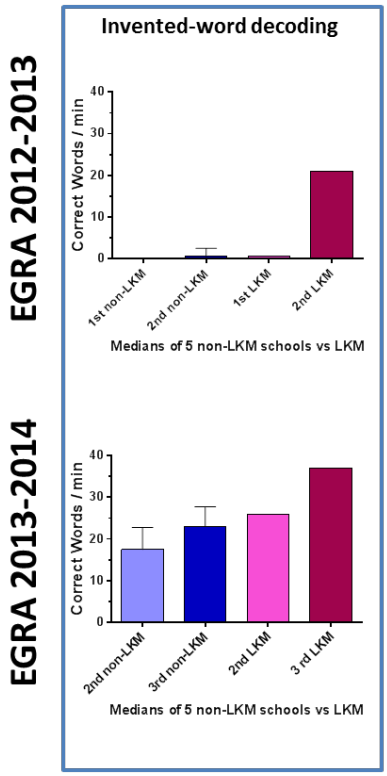
In Figure 5a, the median scores for the 2nd and 3rd graders in all the five non-LKM schools in 2013–2014 range between 5 and 28 correct words per minute (see grey shade in the graph).

Figure 5a: Reading of invented words in final evaluation (2014)



In this subtest as well, the median scores for the 1st and 2nd graders in 2012–2013 (i.e., the medians of the 5 medians for each grade) were extremely low (0 and 0.5) as compared to the medians of their LKM counterparts (0.5 and 21). Here as well, we see substantial progress in 2013–2014 with a narrowing of the performance gap between non-LKM and LKM schools: 17.5 and 23 for 2nd and 3rd graders at non-LKM schools vs. 26 and 37 for their counterparts at LKM.

Figure 5b: LKM/non-LKM medians for invented-word decoding from baseline evaluation in 2013 to final evaluation in 2014

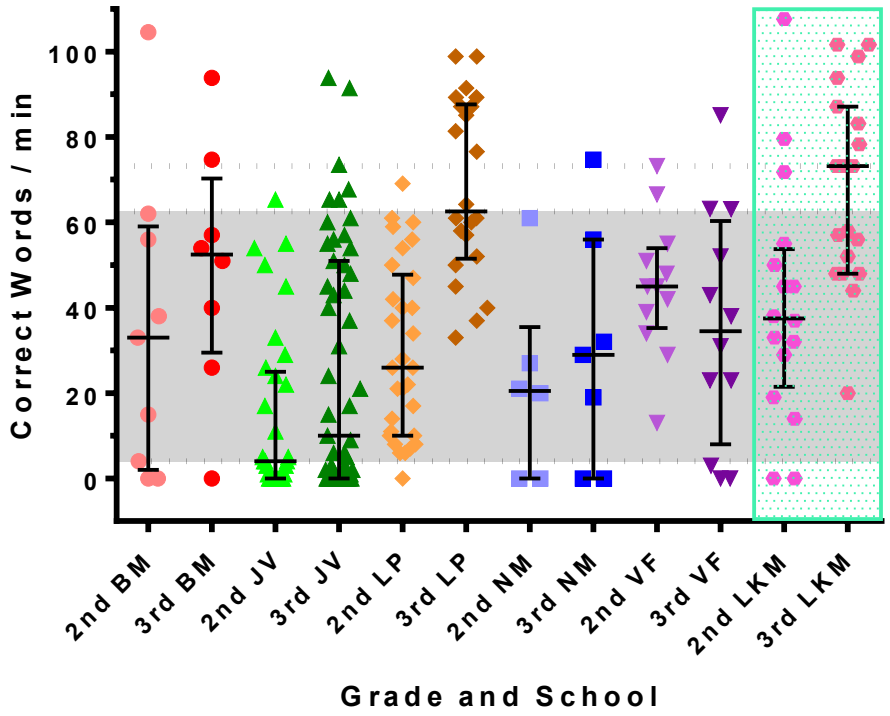


(vi) Reading of Short Story (Figures 6a/b)

In this subtest, the student reads aloud a short story (61 words). In this subtest, the Tangerine's autostop feature is triggered (i.e., the subtest stops) if the student gives incorrect answers for each of the first 11 words of the story.

In Figure 6a, the median scores for the 2nd and 3rd graders in all the five non-LKM schools in 2013–2014 range between 4 and 62.61 words per minute (see grey shade in the graph).

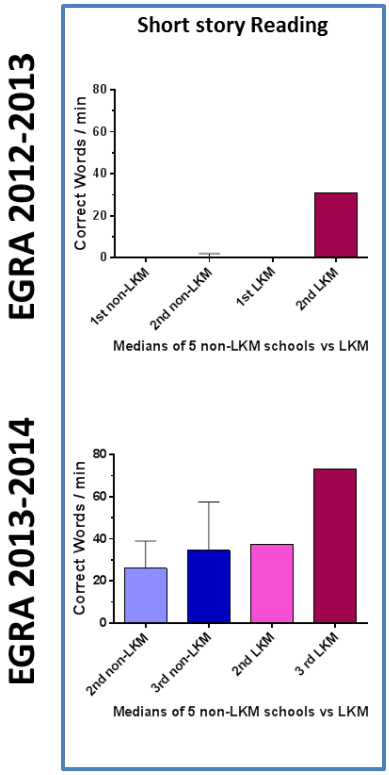
Figure 6a: Short-story reading scores in final evaluation (2014)



In 2012–2013, the median scores for the 1st and 2nd graders for this subtest (i.e., the medians of the 5 medians for each grade) were extremely low: they were both 0 correct words per minute, whereas the medians for the LKM 1st and 2nd graders were 0.5 and 31 respectively. In two schools (École Nationale Mare-Sucrin and Vision Fred) almost all the students were unable to read even a single word.

As Figure 6b shows, the gap between LKM and non-LKM schools have narrowed, with the medians among the non-LKM pupils now equal 26 and 34.5 for 2nd and 3rd graders respectively, as compared to 37.5 and 73.2 for their LKM counterparts.

Figure 6b: LKM/non-LKM medians for short-story reading from baseline evaluation in 2013 to final evaluation in 2014



Another striking result is obtained when comparing the reading-performance data from our study with their analogues from the 2010 World Bank study[11] where the 3rd graders showed an average of less than 23 words per minute when reading a short story. In comparison, the kids in the MTB project show averages of 26 words/minutes for the 3rd graders of the lowest-performing school (Joli Verger) to 68 words/minute for the 3rd graders of the best performing schools (La Pléïade and LKM).

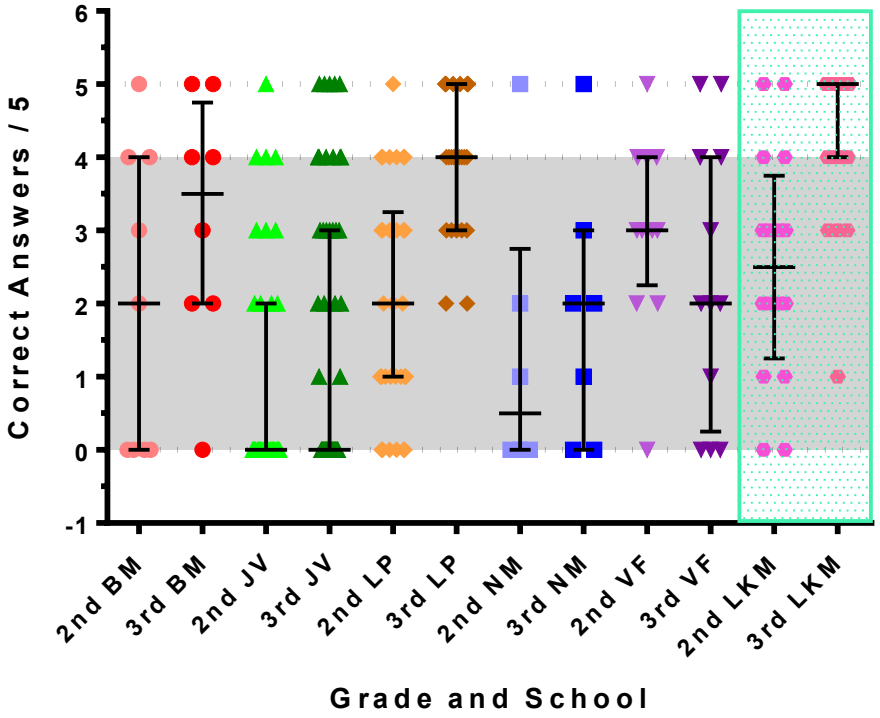
[11] Messaoud-Galusi, S., & Miksic, E. (2010, April). *Haïti: Early Grade Reading Assessment (EGRA). Rapport pour le Ministère de l'Éducation et la Banque Mondiale—Résultats en français et en créole.* Prepared for the World Bank and USAID. Washington, DC: RTI International (available online at: www.eddataglobal.org/reading/index.cfm/Haiti%20EGRA%20Report%20Final.pdf?fuseaction=throwpub&ID=262

(vii) Short-Story Reading Comprehension (Figures 7a/b)

In this subtest, the students are asked 5 questions that test their comprehension of the story they have just read—after the enumerator removes the story from their sight. The students are only asked about the part of the story that they have read.

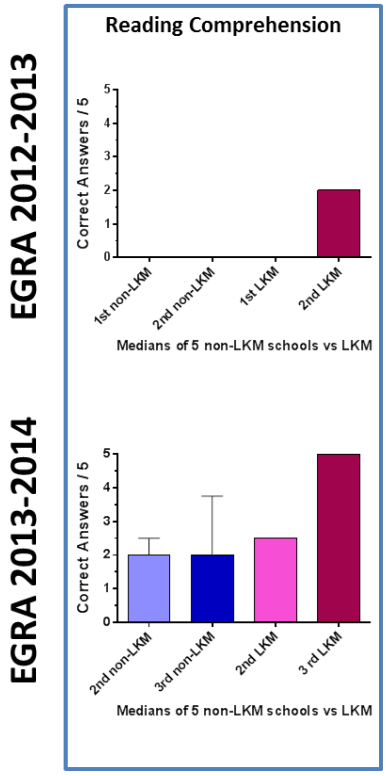
In Figure 7a, the median scores for the 2nd and 3rd graders in all the five non-LKM schools in 2013–2014 range between 0 and 4 correct answers out of 5 (see grey shade in the graph).

Figure 7a: Short-story reading comprehension scores in final evaluation (2014)



In 2012–2013, most of the 1st and 2nd graders in all the five non-LKM schools could not give any correct answer. The median scores for all the five non-LKM schools (i.e., the medians of the 5 medians for each grade) were 0 out 5 in both 1st and 2nd grades whereas the LKM students had medians of 0 out of 5 for 1st grade and 2 out of 5 for 2nd grade. In 2013–2014, the gap between LKM and non-LKM schools is reduced: the 2nd and 3rd grades at the non-LKM schools both have a median of 2 correct answers out of 5, as compared to LKM where the 2nd grade has a median of 2.5 out of 5, and the 3rd grade has a median of 5 out of 5.

Figure 7b: LKM/non-LKM medians for reading comprehension from baseline evaluation in 2013 to final evaluation in 2014



Another striking result is obtained when comparing the reading-comprehension data from our study with their analogues from the 2010 World Bank study[12] where the 3rd graders showed an average of 17% comprehension when answering questions about a short text. In comparison, the kids in the MTB project show averages of 31% for the 3rd graders of the lowest-performing school (Joli Verger) to 77% and 84% for the 3rd graders of the best performing schools (La Pléïade and LKM, respectively).

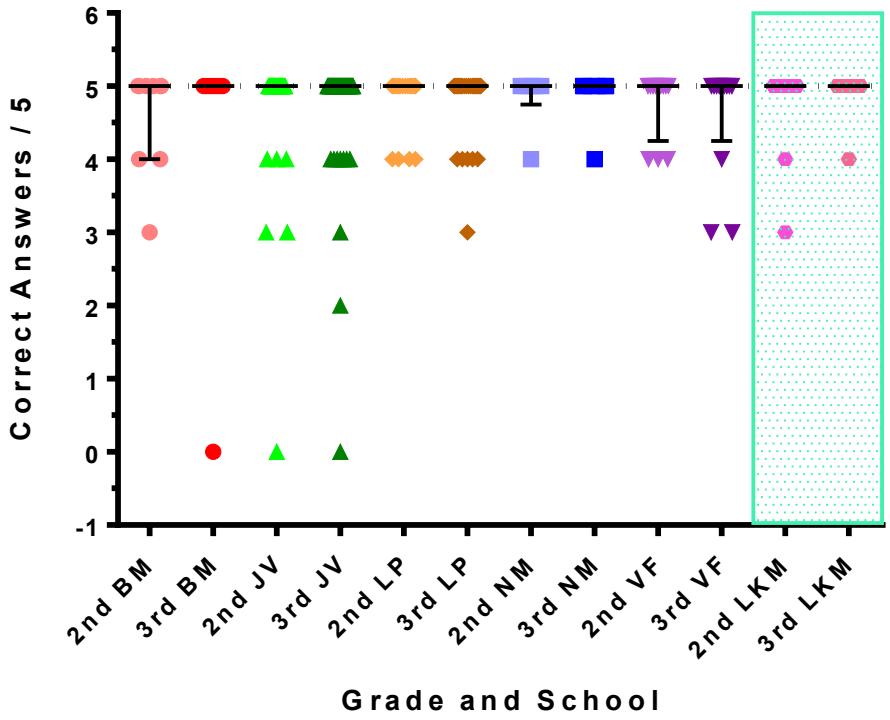
[12] Messaoud-Galusi, S., & Miksic, E. (2010, April). *Haïti: Early Grade Reading Assessment (EGRA). Rapport pour le Ministère de l'Éducation et la Banque Mondiale—Résultats en français et en créole.* Prepared for the World Bank and USAID. Washington, DC: RTI International (available online at: www.eddataglobal.org/reading/index.cfm/Haiti%20EGRA%20Report%20Final.pdf?fuseaction=throwpub&ID=262

(viii) Oral-Story Comprehension (Figures 8a/b)

In this subtest, the enumerator reads a short story to the student. The numerator reads the story twice, and then the enumerator asks 5 questions in order to test the student's comprehension of the story.

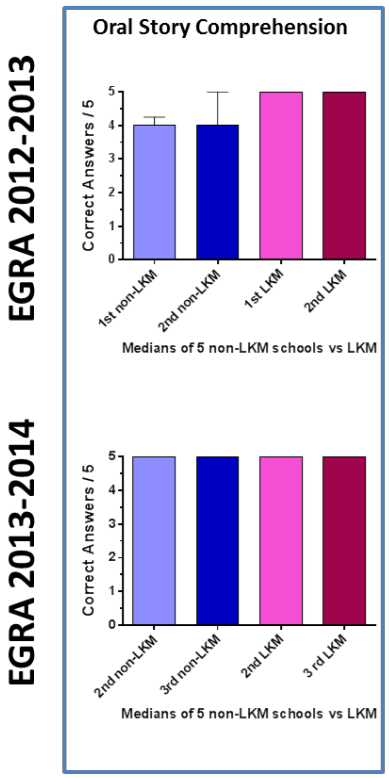
In Figure 8a, both 2nd and 3rd graders in all the schools (both LKM and non-LKM) have a median of 5 correct answers out of 5.

Figure 8a: Oral-story comprehension in final evaluation (2014)



In 2012–2013, this oral-story comprehension subtest was the only one where the LKM and non-LKM pupils showed similar performance: both the 1st and 2nd graders at the non-LKM schools had medians of 4 correct answers out of 5 whereas the LKM 1st and 2nd grades both had a median of 5 out of 5. (NB: The non-LKM medians refer to the medians of the 5 medians for each grade.) As we noted in the baseline report, the similar performance in listening comprehension suggests that the LKM are not inherently smarter than the non-LKM pupils. Indeed, listening comprehension, unlike literacy, is a skill that all of the pupils, whether at LKM or elsewhere, are equally good at, independently of their respective reading levels. This led us, in the baseline report, to suggest that the major reason why the LKM pupils had better scores on tests involving reading skills, but not on oral comprehension, is likely because the LKM pupils have benefitted from the MTB methods. But now, with the 2013–2014 results at hand, it seems to us that improved reading skills can actually help improve listening comprehension. This is suggested by the comparison of the LKM-vs.-non-LKM medians across the baseline vs. final evaluation: at the final evaluation in 2014, the 2nd and 3rd grades at both LKM and the non-LKM schools had medians of 5 out of 5.

Figure 8b: LKM/non-LKM medians for oral-story comprehension from baseline evaluation in 2013 to final evaluation in 2014



Conclusion

We now have a solid data set about the impact of the MTB evaluation on the reading levels of two cohorts, starting with baseline assessment data about 1st and 2nd graders in 2012–2013 (for a total of 218 students), then comparing this baseline with a final evaluation of the same cohort of students now in 2nd and 3rd grades in 2013–2014 (now a total of 225 students, due to new enrollments). As documented in the graphs above, the non-LKM pupils in these cohorts have narrowed the reading-assessment gap with their LKM counterparts.

These results are made even clearer when we compare the performance of the 2nd graders in academic year 2012-2013 with the performance of another set of 2nd graders in academic year 2013-2014. Each graph in Figure 9a/b on the next two pages has two horizontal lines, in dashes: the lowest line is the highest median across all the non-LKM schools for 2012–2013 and the highest line is the highest median across all the non-LKM schools for 2013–2014. With all the graphs taken together, it is apparent that, for each EGRA subtest, the medians of the 2nd graders across all non-LKM schools have improved with time whereas the medians of the 2nd graders in LKM have remained quite similar overall.

Figure 9a: EGRA scores for 2nd graders in 2012–2013 vs. 2013–2014 (I)

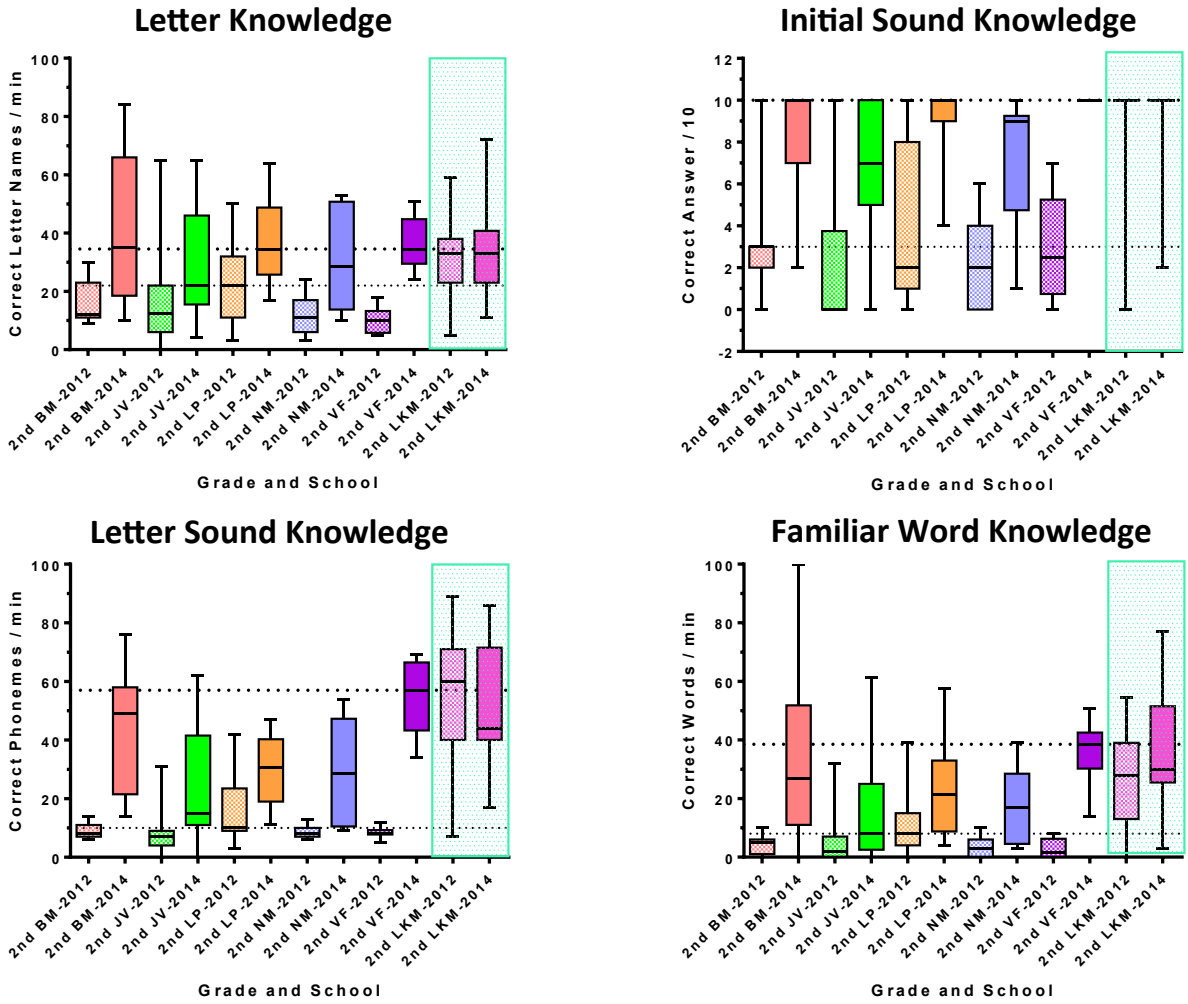
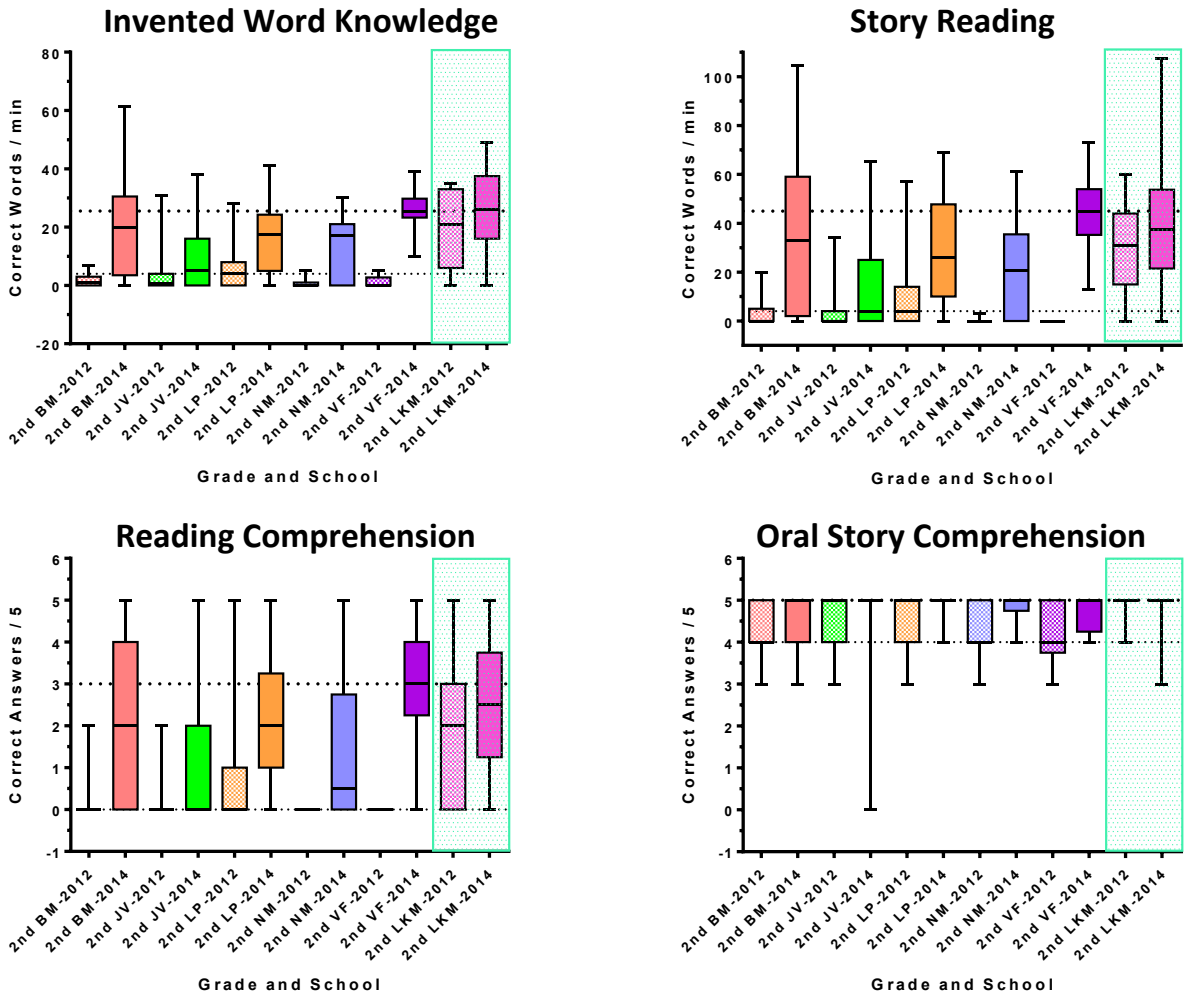


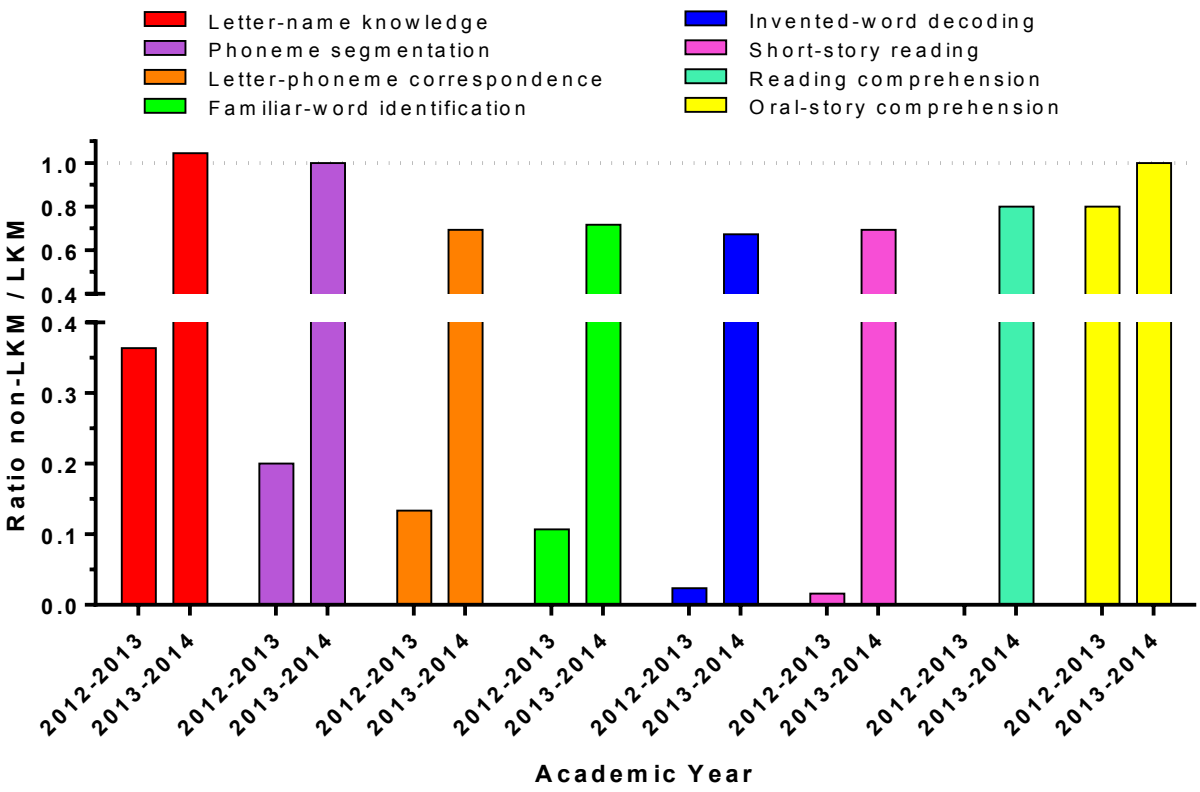
Figure 9b: EGRA scores for 2nd graders in 2012–2013 vs. 2013–2014 (I)



To recapitulate, the 2nd graders at LKM performed similarly across the academic years 2012-2013 and 2013-2014. Compared to LKM's 2nd graders, the 2nd graders in the non-LKM schools have consistently improved their performance from one academic year to the next.

The data below (in Figure 10) further illustrates the progress of the non-LKM schools.

Figure 10: Non-LKM/LKM ratio of medians on each EGRA subtest for 2nd graders in 2012–2013 then 2013–2014



The graph in Figure 10 was generated by dividing, for each EGRA subtest, the median of the non-LKM pupils' scores by the median of the LKM pupils' scores. For each subtest, we have the non-LKM/LKM ratio for academic year 2012–2013 followed by the ratio for academic year 2013–2014. A ratio of 1, as indicated by the horizontal line in dashes, would indicate an (approximately) equal performance across LKM and non-LKM students. From Figure 10 as well, it is apparent that the non-LKM pupils are progressing toward LKM-level performance. Indeed the performance gap between LKM and non-LKM schools has been reduced across all subtests—with the non-LKM-to-LKM ratio of scores increasing toward a ratio of 1 in 2013–2014.

These results suggest that the MTB-based methods have indeed helped improve the reading levels of the schools in the project, raising them to the level of LKM.

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