



SANDBOX OVERVIEW

Mango Tree Literacy Lab's Radio Programme Sandbox

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Notes

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About the EdTech Hub Sandboxes and Sprint Reviews

A Sandbox fast-tracks promising EdTech interventions by providing funding, tools, and access to evidence. It provides a space for partners to test and grow ideas in conditions of uncertainty. We break Sandboxes up into short sprints, learning and iterating as we go. Each sprint informs changes and new ideas for the next.

Sprint Reviews and Overview Reports (like this one) allow for Sandbox partners to share their insights by capturing what was tested, what was learned, and how it might inform their intervention moving forward. In doing so, these documents also serve as case studies for the broader EdTech community. For more information, please visit <https://edtechhub.org/innovation/>.

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Abbreviations and acronyms

LCC	Learning Centre Co-ordinator
MoES	Ministry of Education and Sport
MTLL	Mango Tree Literacy Lab
RDC	Resident District Commissioner
DEO	District Education Officer
DIS	District Inspector of Schools
CCT	Coordinating Centre Tutor
VHT	Village Health Teams
SOP	Standard Operating Procedure

1. Origin of Mango Tree's Radio Programme

As schools in Uganda closed down in late March due to Covid-19, Mango Tree Literacy Lab (MTLL) had to reconsider our 2020 work plan. When the Ministry of Education and Sports (MoES) published its *Framework for the Provision of Continued Learning During the Covid-19 Lockdown in Uganda* and began radio education programmes in the Lango sub-region, we decided to develop our own radio education programming focused on literacy instruction for children in Primary 1 to Primary 3 (P1–P3), an area of the curriculum that the MoES was not able to address because it required creating materials in multiple local languages. With no dedicated funding for this, we partnered with Radio Q FM, a local radio station, who generously agreed to provide us with one hour every Saturday for no charge.

In May 2020, Mango Tree, together with Ichuli Institute, responded to a call by EdTech Hub for non-internet education innovations that addressed the Covid-19 crisis. Upon selection to participate, we ran a Sandbox in the four districts of Alebtong, Dokolo, Kole, and Otuke, in the Northern Uganda Lango sub-region from September to December 2020.

The hypothesis driving the pilot

“If we deliver radio content alongside a supportive human infrastructure and simple supplemental materials, then we can cost-effectively teach literacy in local languages and English to primary-age children when they are not in school so that they achieve meaningful literacy competencies.”

To test this hypothesis, we involved a wide variety of stakeholders in the administration of this programme, including education sector professionals at the district level, teachers' college, primary schools, parents, community, and the learners themselves, who were the end beneficiaries of this project. In Section 2, we describe this model in detail, focusing on its three main components: radio programming, a supportive infrastructure of community actors, and supplementary materials.

To validate our hypothesis, we used learner assessment tools, videos, and other qualitative and quantitative tools, collecting data over the 3-month pilot period. In Section 3, we describe our key findings structured in accordance with the six critical beliefs underpinning our hypothesis.

Lastly, in Section 4, we conclude by outlining some of our key takeaways and next steps.

2. What did we do?

The Mango Tree radio programme knew from the beginning that radio instruction alone was unlikely to bring about significant learning gains for students in Northern Uganda. With this in mind, we supplemented high-quality radio instruction with a supportive human infrastructure of community actors and supplementary materials to guide both community facilitators and learners. Below we describe each of these three pillars of the model.

Mango Tree radio content

The institutional values of MTLL and Ichuli are to support national policies, so our pedagogical approach to radio instruction was framed by the Ugandan National Primary Curriculum and the recently introduced National Literacy Model for Early Primary learners. We began by selecting the national competencies for local language and English literacy that we felt could be taught effectively through radio instruction.

Our content covered literacy competencies from the first term of Primary 1. The content was delivered over 12 one-hour radio programmes that were broadcast on consecutive Saturdays from 12–1 pm. We organised the 12 radio programmes into two series of six shows: five pre-recorded shows delivering literacy content, followed by a sixth show, which featured feedback from the listening audience — captured through pre-recorded audio content gathered from listeners, parents, co-teachers, and others in the field. The sixth show of both series also included learning assessments of individual listeners at their respective centres.

Episodes included 45 minutes of instructional content plus commercial breaks. These breaks meant instruction had to be divided into four segments: the first was fifteen minutes long (from 12:00–12:15) and the last three were each ten minutes long, with five-minute commercial breaks between segments. Breaks were used as an opportunity for the co-teachers to actively engage listeners on the content presented in the previous segment.

Below we outline the structure of the radio programme:

Segment 1 — reading and writing competencies

These are based on the national literacy model's 'Literacy Hour' but were compressed into fifteen minutes of direct instruction with controlled, call-response participation by the listeners. Each week introduces a new letter of

the alphabet. Listeners learn the name and sound of a letter, how to write the big and small forms and blend the letter sounds to form words.

Segment 2 — storytelling

This focuses on listening and speaking competencies and is based on the 'Oral Literature' and 'News' lessons in the national curriculum. During 'Oral Literature' weeks, the radio teacher reads a story and the focus is on building listening comprehension and vocabulary. During 'News' weeks, the radio teacher models storytelling based on a theme from the curriculum, and also models speaking competencies. After listeners hear the radio teacher's story, they write their own real-life story using pictures and then tell their story to their friends, co-teacher, and family members.

Segment 3 — English language learning

In Primary 1 in Uganda, English is oral only with a focus on developing vocabulary and simple conversational structures.

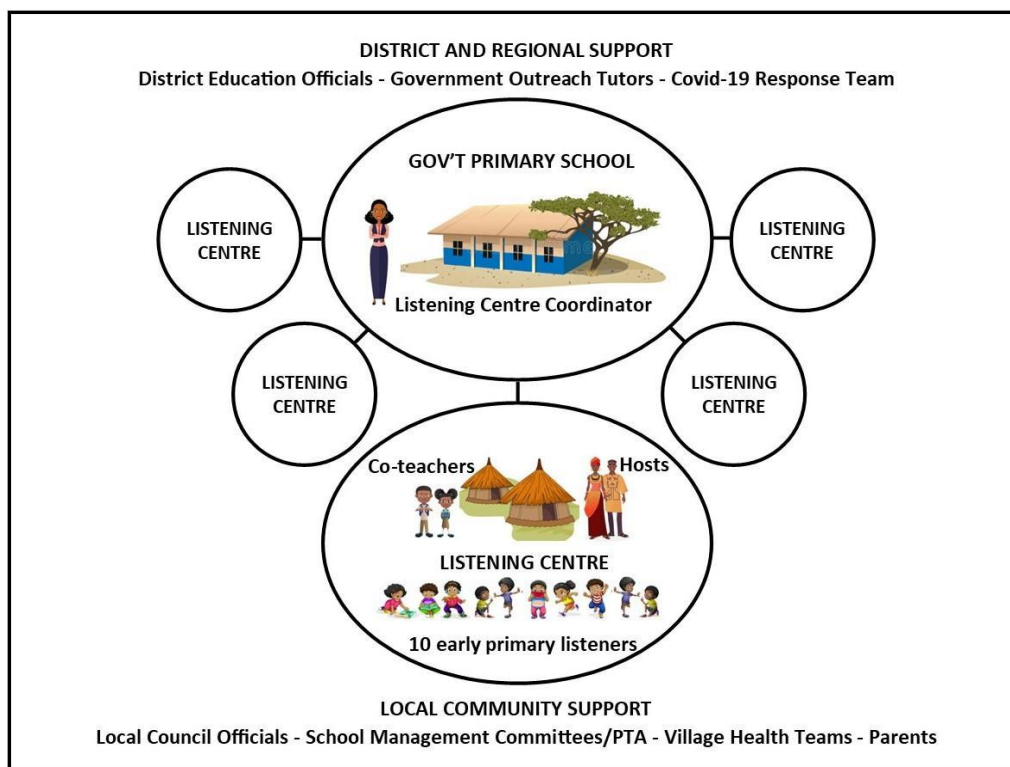
Segment 4 — practice games and activities

The radio teacher shares games and activities that the children can do both during and after the radio show. These provide additional practice using the skills learned during the first three segments. The radio teacher also shares simple instructional materials that the co-teachers and listeners can make.

Supportive community infrastructure

At the top of our infrastructure model were district leaders, selected from the education department to supervise our work. Government outreach tutors from the regional primary teachers' college were also selected to provide weekly supervision at the primary-school level. The Covid-19 task force for each district was also involved to ensure the model was Covid-19 secure and to support and direct the village health teams who were supervising the individual listening centres.

Figure 1. *Mango Tree community infrastructure.*



The government primary school was the hub of our model. In each school, an early primary teacher with demonstrated ability in teaching literacy was selected as the Listening Centre Coordinator (LCC). Together with the head teacher, LCCs identified families with working radios who would be willing to host a group of about ten children at their home for the Saturday radio show.

We also asked the LCC to go to the Local Village Council and Village Health Team to seek their support of the listening centre. The School Management Committees and PTAs, as well as individual parents, were also involved to various degrees in supporting the listening centres.

With these supportive systems established at both the district and village level, each identified Listening Centre selected two volunteer co-teachers to supervise and support the listeners, both during the radio show and through additional tutoring throughout the week. Co-teachers included other classroom teachers at the school, parents, caregivers, and secondary school students. But the majority of the co-teachers were upper-primary school children from the school.

Listening Centre Coordinators met with all of their co-teachers each Friday for about 90 minutes to prepare them for the Saturday radio show content and to lead a community-of-practice training session where co-teachers supported each other to develop their skills as literacy tutors.

Simple supplementary materials

Our model included three types of supplemental materials.

Participation agreements

Over our 10 years of experience, we have learned to always outline what we are providing to project participants and what we expect from them in return. Participation agreements were signed by all project stakeholders, from district officials to parents, to ensure positive accountability and alignment of expectations.

Implementer handbooks

District Officials, Listening Centre Coordinators, Listening Centre Hosts and co-teachers each received a guidebook that gave them all the information they needed to effectively implement their role in the project. These were distributed at orientation workshops at the beginning of the Sandbox.

Instructional materials for the listeners

These included workbooks on handwriting and visual discrimination, as well as local-language storybooks and government literacy textbooks. Supplemental resources were also provided to co-teachers including a chalkboard, materials for making flashcards, and other literacy materials. Lastly, the kit included listener assessments that were administered by co-teachers at weeks 6 and 12 and sent home so that parents might understand their child's progress in obtaining key literacy competencies. The instructional materials for listeners were distributed to listening centres the week before the first broadcast.

Figure 2. *Mango Tree Sandbox in numbers*

- 4 Pilot Districts in the Lango sub-region
- 1 District Education Point Person per district (4 District Education Officials in total)
- 1 Covid-19 Task Force Member per district (4 Covid-19 Task Force Members in total)
- 1 Government Outreach Tutor per district (4 Outreach Tutors in total)
- 5 Pilot Primary Schools per district (20 Pilot Schools in total)
- 1 Listening Centre Coordinator per school (20 Listening Centre Coordinators in total)
- 5 Listening Centre Hosts per school (100 Listening Centre Hosts in total)
- 2 Co-teachers per listening centre (200 Co-teachers in total)
- 10 Listeners per listening centre (1,000 Listeners in total)

3. What did we learn?

Throughout the Sandbox process, 'critical beliefs' have been identified and tested in order to assess the validity of the implementing model. These are essentially *assumptions*, which, if validated via evidence gathered, will enable us to have a higher level of confidence in our model. This section summarises some of the most compelling findings from the Mango Tree Radio Programme pilot, organised according to critical beliefs.

Critical belief 1

Parents want their children to access educational opportunities while out of school and will encourage them to listen to the radio programme and provide support if clearly directed.

Summary of findings

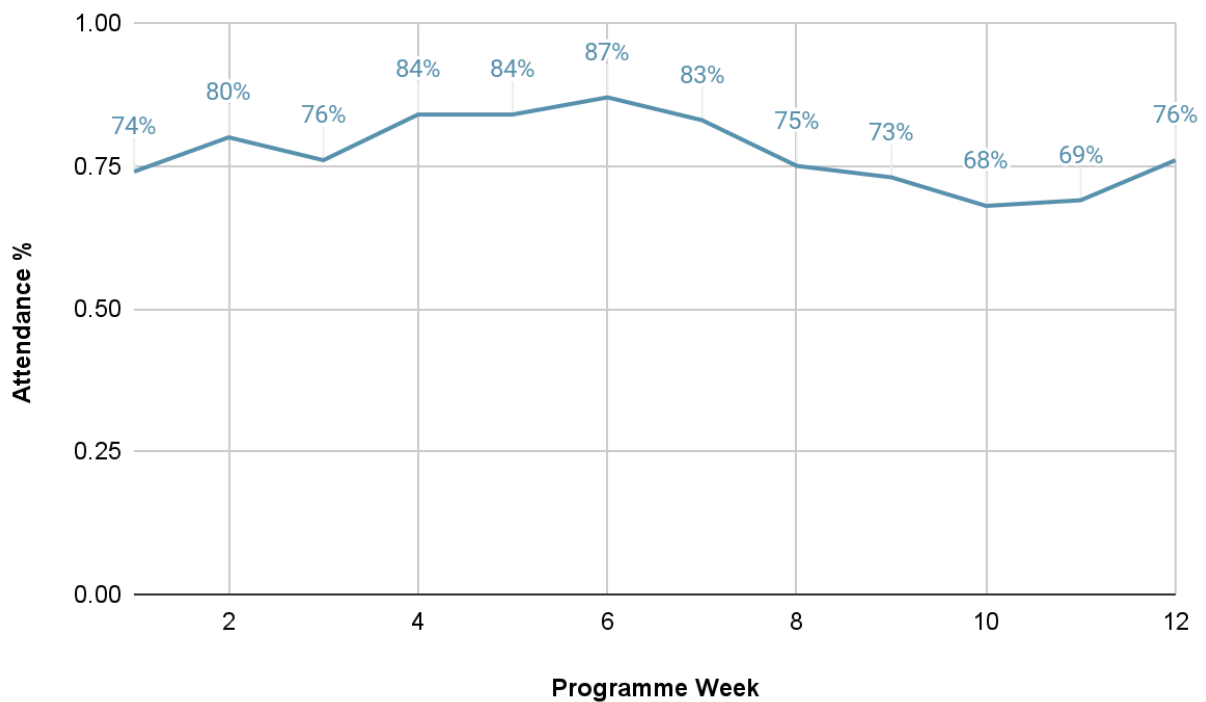
Parents have shown a great willingness to support their children while out of school by ensuring they consistently attend listening centres, providing scholastic materials, and often attending the radio shows themselves.

Our findings show that parents are very engaged and interested in their children's access to education during this lockdown period. This is evident from the following key findings listed below.

Learning centres counted on strong attendance, of both learners and parents

During the 12 weeks when the radio programme was being broadcast, learners' attendance at listening centres was consistent — with an average attendance of 77.4% by registered learners. This high attendance level is illustrative of parents' willingness to let their children travel to listening centres and of their support of their children's learning during school closures.

Figure 3. Trends in learners' attendance across the 12 weeks of the pilot.



Parents themselves also engaged with the listening centres more than originally expected, and this increased over time. Parental attendance during radio shows was on average 23.5% at week six and grew to 35% at week 12 — a sign of their increased interest and support of the programme.

Aside from parents, our original critical belief underestimated the extent to which other caregivers and community members would engage with the learner centres. Our attendance tracking showed that a wide variety of stakeholders regularly attended these sessions, including older siblings, aunts, uncles, and cousins, interested neighbours, and others. In fact, learning centres became something of a community attraction.

In addition to ensuring attendance, parents also provided support and encouragement

Our parent surveys highlight the many ways in which parents have supported learners to engage with learning centres, including:

- Parental contributions to the learning centres' progress by helping to maintain hygiene, ensuring Covid-19 measures were respected, and by helping to maintain discipline.
- Parents provided scholastic materials. Many parents provided pens, pencils, exercise books, papers, and book bags for the learners.

- Parents seemed invested in their children's learning.

Many parents demonstrated an interest in their children's progress, and wrote encouraging comments in textbooks and asked for report cards after learning assessments. Some even suggested that meetings should be held to provide caregivers with guidance on how best to support their children in reading at home.

Critical belief 2

Children in early primary (ages 6–8) have the attention span to listen to a one-hour radio programme (four lessons of about 10–15 minutes each) if we utilise best practices in radio pedagogy and leverage facilitation from co-teachers.

Summary of findings

An overwhelming majority of learners were engaged in actions as directed by the co-teacher throughout the one-hour radio programme, with 88% of learners actively engaged in listening and writing tasks. Co-teacher facilitation proved largely effective.

Learning centre observations point to a high level of engagement by learners

On average, 88% of learners were engaged in listening and reading tasks across the four lesson segments (as opposed to being distracted or disinterested), with engagement generally peaking at around 90% in the first segment and declining to an average of 85% by the fourth segment. This high level of engagement is testament to the engaging nature of the radio programme and the effectiveness of co-teacher facilitators.

Co-teachers were capable facilitators

Observations found that a majority of co-teachers established positive relationships with learners and demonstrated positive teaching practices, including pairing learners so that they might practise new skills, helping individual learners who seemed to be falling behind, providing learners with additional practice exercises, modelling expected actions, highlighting errors and how to correct them, and utilising instructional materials (flashcards, letter name cards, pictures, etc.) effectively. While some co-teachers performed poorly, at times not following the radio instruction or ignoring distracted learners, in general, their facilitation was observed to be positive, and it contributed to high engagement.

Recommendations from learning centre coordinators

While engagement was high, learning centre coordinators provided some recommendations on how instruction and time on task could be improved.

- Some suggested that the content covered across four segments was too much to cover in one hour, and suggested paring down the content per episode.
- Additionally, coordinators suggested that co-teachers should receive a copy of each week's radio script.

Due to the limited time, it was also challenging for co-teachers to make full use of the supplementary materials provided to learners. To take full advantage of the resources, listening centre coordinators encouraged the co-teachers to create additional lessons outside of the radio programme. Co-teachers embraced this idea, as it gave them an opportunity to demonstrate their teaching skills. In future, Mango Tree plans to compile listener activities in one workbook to accompany the radio show.

Critical belief 3

Early literacy competencies like knowing the names of letters, decoding, listening comprehension, and handwriting can be taught over the radio if we provide human and material support.

Summary of findings

Across weeks 1–12, learners exceeded their competencies in name writing and their knowledge of letter names, they could properly handle print materials and were able to comprehend the stories they heard. The majority of co-teachers were present at the listening centres and engaged with the learners. They also found the materials really helpful.

As we set out to pilot this model, we believed that early literacy gains would be possible if learners engaged with our radio lessons, and if they were provided with consistent support from co-teachers and materials. As we have demonstrated above, both the attendance and facilitation from co-teachers led to meaningful engagement with the instructional content. However, can we be sure that this has led to tangible improvements in learning?

To assess the effectiveness of our model, we conducted pre- and post-assessments at weeks 2 and 12 of the programme.

Learners attending the listening centre learners are improving in key literacy competencies from radio instruction

The findings show that learners have progressed relatively well after 12 weeks of the pilot in the different competencies.

Figure 4. Comparison of listeners' pretest and the post-test performance.

Assessment (items assessed)	Average Correct	Average Score	Average Score Increase
Name writing: spelling and letter formation (12)	7.5	62.5%	+16.1
	9.4	78.6%	
Letter name knowledge (50)	16.0	32.0%	+27.6
	29.8	59.6%	
Print awareness (5)	3.6	72.5%	+12.7
	4.3	85.2%	
Listening comprehension (3)	2.0	65.4%	+9.2
	2.2	74.6%	

The results from each competency are broken down below in more detail.

Name writing

A 12-point rubric was used to evaluate listeners' ability to write and spell their names correctly with a score of 8 points considered 'competent' for P1 learners. At the beginning of the pilot, the average score (7.5 points) indicated a majority of listeners had not attained competency. By week 12 the average score increased to 9.4 points, indicating that many listeners had improved their ability to write their names.

Letter name knowledge

At the beginning of the pilot, learners scored an average of 32.0% meaning that they could only correctly identify 16 out of 50 letters by name, but by week 12, the learners average had significantly increased (by 27.6%) to 59.6%. This meant that on average learners could correctly identify 30 out of 50 letters by name, nearly doubling the number of letters they were able to identify.

Print awareness

In the post-test, over half (53.4%) of learners assessed could correctly identify *all* five print awareness components, an increase of 25% from the pre-test scores (28.3%)

Listening comprehension

Initially, learners scored an average of 65.4% meaning that they could listen to a story and answer only two out of three comprehension questions correctly. By week 12, learners' average scores had increased to 74.6%.

These results are extremely encouraging, showing that in a short number of weeks, basic learning gains can be achieved through the Mango Tree Radio Programme.

Critical belief 4

Community members outside of the target listening centre learners, including listening centre co-teachers, school teachers, and caregivers, even if not directly involved in the pilot, will gain additional knowledge and skills to support early literacy instruction.

Summary of findings

Co-teachers directly involved in the learning centres (many of them primary school learners themselves) saw significant increases in their own literacy competencies. We were unable to measure the impact of the programme on school teachers' and caregivers' competencies at this time.

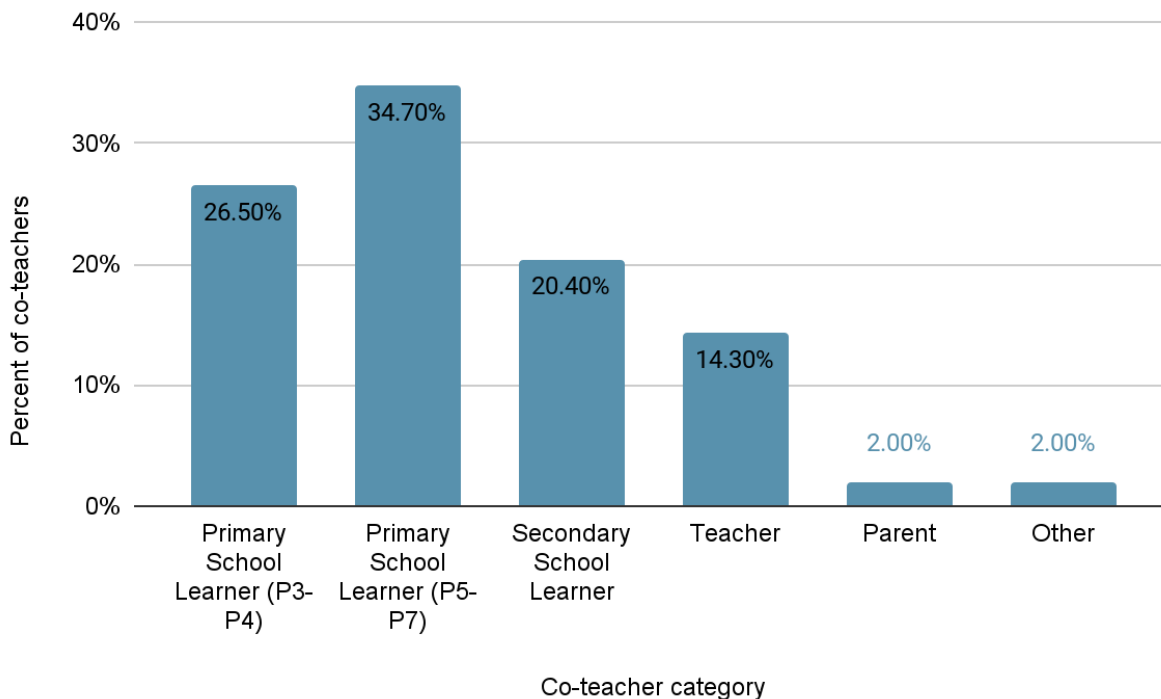
Early on in the design of this pilot, we wondered whether co-teachers, teachers, and caregivers in each of the target communities might also gain skills and knowledge about early literacy by listening to the radio show. While we do have anecdotal comments from teachers and district education officers that they listened and really valued the radio programmes, we were unfortunately not able to fully investigate whether teachers and parents gained additional knowledge from the radio programmes due to the tight timeline and lack of the team's capacity. We did, however, assess co-teachers (many of them primary and secondary school students themselves) on several early literacy outcomes and found promising results.

Co-teacher demographics

As Figure 4 (below) illustrates, our model's co-teacher cohort was composed of several different community stakeholders. Notably, the majority of the

co-teachers are in upper primary with over 60% of the co-teachers coming from primary grades.

Figure 5. Categories of co-teachers.



Co-teachers’ literacy assessments

Figure 5 shows that there was a marked improvement in the co-teachers’ literacy competencies from week 6 to week 12 across spelling, reading, writing letters, and English comprehension. It is worth noting that the majority of the co-teachers are actually school-going listeners and notably 60% are in primary grades and thus have also been affected by the school closures. These gains show that the programme is benefiting these co-teachers as well and not just the listeners at the listening centres. This is a direct result of the support and mentoring they have received from the listening centre coordinators.

Figure 6. Comparisons of pre-test and post-test performance of co-teachers.

Assessment (items assessed)	Average Correct	Average Score	Average Score Increase
Spelling (5)	4.0	80.7%	+10.9
	4.6	91.6%	
Reading comprehension (30)	22.9	76.3%	+12.7

	26.7	89.0%	
Creative writing (12)	7.9	66.0%	+7.7
	8.8	73.7%	
Letter name knowledge (50)	40.6	81.2%	+14.3
	47.8	95.5%	
English comprehension (10)	9.3	93.3%	+5.2
	9.9	98.5	

These results hint at the potential of Mango Tree’s Radio Programme to impact the broader community beyond P1–P2 learners and demonstrate its potential as an opportunity for primary and secondary school learners to reinforce their literacy skills by volunteering as co-teachers. The Mango Tree team continues to be interested in the possibility of an investigation into the broader community impact of the programme.

Critical belief 5

Government (and relevant officials) will be supportive, cooperative, willing, and engaged partners during the pilot process.

Summary of findings

Stakeholders at the top government authority at district level, education department heads, college principals, and coordinating centre tutors were willing and engaged during the pilot. These are government organs and positions that are the main support structure for teaching and learning at the district level.

A wide range of local government officials was involved throughout the implementation of listening centres. Below, we list relevant government bodies and representatives, who together with other community stakeholders (LCCs, co-teachers, and host families) make up Mango Tree Radio Programmes’ broader human infrastructure, which we deem crucial to the success of the model.

- **Resident District Commissioner (RDC)** (4): these representatives from local government head the Covid-19 task force in every district and they played a crucial role in granting the teams authority to work in communities.
- **District Education Officer (DEO) / District Inspector of Schools (DIS)** (4): these government officials lead each district’s education

department. They played very important roles in sensitisation, technical guidance, and monitoring, reporting, and giving feedback about listening centres.

- **Coordinating Centre Tutor (CCT)** (4): these teacher-tutors usually provide technical supervision in school classrooms. In our programme, they helped to identify participating schools, recruited Local Council Chairpersons (LCCs), monitored listening centre implementation, and provided useful feedback on programme implementation.
- **Village Health Teams (VHTs)** (100): these teams were in charge of monitoring the health situation at village level. They ensured that all listeners and families were adhering to Covid-19 standard operating procedures (SOPs).
- **Local Council Chairperson** (100): These are administrative heads of the village who ensured the safety of learners at the listening centres and their general well-being and were also responsible for ensuring adherence to Covid-19 SOPs.

Planned engagements with the government officials in charge of the districts, education sector, teacher education, and monitoring health and safety at village level were all successfully conducted, and in most cases, attendance was 100%. Their high level of engagement is not only a validation of our critical belief, but testament to their level of cooperation, support, and willingness throughout the pilot process. There is, of course, always room for improvement. For instance:

- **Ensuring inclusion of village-level secretaries of education.** While Local Council Chairpersons and VHTs were very receptive and supportive of the programme, in the future, provision should be made for the inclusion of Local Council Vice-chairpersons who are also the secretaries for education at village level.
- **More outreach at village level.** Local Council Chairpersons suggested that there should be more focus on lower-level cadres rather than the top district officials.

Critical belief 6

Building on our relationships with our target communities, we believe we can build a supportive human infrastructure (inclusive of government officials, teachers, parents, and volunteer co-teachers) to effectively facilitate learning through engagement with the radio programme.

Summary of findings

MTLL effectively brought together a network of community stakeholders to support listening centres, including capable Local Council Chairpersons who were crucial to the identification, recruitment, and training of co-teachers. This network ensured the model's impact and also led to many important lessons.

In addition to the government stakeholders named in the previous section, community members who were crucial to the success of the listening centres' include:

- **Listening Centre Coordinators (LCC)** (20). LCCs are community teachers who were each put in charge of five listening centres around their schools. In this role, LCCs recruited and guided the co-teachers (by conducting weekly training and monitoring listening sessions), mobilised the school community, identified homes for hosting the radio lessons shows, and undertook data collection on Mango Tree's behalf.
- **Co-teachers** (200). Co-teachers were responsible for facilitating the radio lessons. They were the direct link between the learner, the lesson, and the materials. They engaged learners before, during, and after the radio lesson shows.
- **Host families** (100). These were the parent volunteers who hosted the listeners and the radio lesson shows at their homes and kept learning centres hygienic and Covid safe.

As noted in previous sections, the high level of engagement by listening centre learners is directly connected to the facilitation by co-teachers, and support provided by the broader human infrastructure developed by MTLL. In addition to the learning gains already reported, a number of other additional data points are worth noting.

- **High co-teacher engagement.** During the radio lesson observation, we noted that at least two co-teachers were present at the listening centre 88.2% of the time.
- **Ad hoc listening centres.** In some villages, it was reported that some LCCs and parents created their own listening centres (without supplemental materials) to meet demand in their communities.
- **LCCs noted that the lessons were well aligned with the syllabus,** especially as it relates to basic reading and writing competencies.

Some additional insights regarding components of the radio programme, which contributed to these gains (or places where improvement was possible) were captured through our focus group discussions.

- **Co-teachers greatly appreciated how the guidebook aided their facilitation.** The inclusion of reflection journals within the guidebook was also greatly appreciated. However, some (especially the younger co-teachers) noted that the guidebooks were confusing and difficult to navigate.
- **LCCs suggested that stories and vocabulary used during each week of radio programming should be put into the handbook** to enable the LCCs and co-teachers to familiarise themselves with them.
- **Additional resources for LCCs.** In order to do their work well, LCCs reported they would benefit from a work plan which would help them with better coordination. They also requested a communication allowance to help them to be more mobile and to facilitate transport, or to be provided with bicycles since some of the listening centres are very far apart.
- **Addressing co-teacher turnover.** Concerns were raised about co-teachers who are students themselves and might resume school soon and thus leave the programme. LCCs suggested that in the long-term, nursery school and unemployed teachers should be brought into the programme as co-teachers and that co-teachers be given a more tangible token of appreciation for work well done.

4. Next steps

Our hypothesis stated that:

“If we deliver radio content alongside a supportive human infrastructure and simple supplemental materials, then we can cost-effectively teach literacy in local languages and English to primary-age listeners when they are not in school so that they achieve meaningful literacy competencies.”

Beyond the critical beliefs summarised in this report, the data above has shed some light on a number of key questions, with broader potential implications.

Can the radio programme alone facilitate learning?

At this point, we do not believe that radio *alone* can foster improvements in learning outcomes, at least not for young learners. The evidence summarised above has demonstrated that learning is not only about listening to a radio teacher and following their instructions. The human element coupled with simple but effective instructional tools is essential for real gains in children’s literacy competencies. Learners need individual guidance. They need repetition and practice beyond the one-hour radio show. They need engaging multisensory experiences that bring literacy to life. And finally, they need regular assessment to measure progress and hold the programme accountable. The evidence has shown us that measurable gains in key literacy competencies can be obtained in radio instruction for early primary learners when they have appropriate content developed especially for the radio, a supportive human infrastructure, and appropriate supplemental resources for instructors and learners.

Can co-teachers teach learners? Can anyone be a teacher?

This model sought to identify who is able to facilitate learning for early primary children. As described above, co-teachers ranged from caregivers, community members, trained teachers, and even to primary and secondary school students. Indeed, peer-to-peer learning has been advocated in many studies as one of the key ways of fostering learning, and the results we report seem to indicate that both learners and co-teachers benefit from engagement in this model. As we transition from this period of school lockdowns to a radio education model that provides remedial support to learners returning to the classroom after a year-long break, we are looking at two possible models.

Using learners in upper primary

Upper-primary learners have demonstrated that with the proper tools and instruction, they can be effective peer tutors. Keeping the co-teachers under the roof of the primary school has significant advantages for programme delivery and training. It also has the additional benefit of also developing the academic and leadership skills of the peer tutors — as our data indicate.

Parents and community members with basic literacy skills

Parents and community members who have basic literacy skills also proved to be effective co-teachers during our Sandbox. Could there be an advantage to taking the model outside the boundaries of the school and creating a radio education model that empowers community members to provide demonstrably effective tutoring services for a small profit? We would continue to provide the weekly radio programme and the necessary supplemental materials. Some of these supplemental resources could be sold to parents who want their child to receive the tutoring services. This model might prove to be more sustainable. It also has the advantage of circumventing the challenges of operating inside a large government bureaucracy.

Can listeners learn outside a traditional school setting?

In its real sense, a school is not just a building, it is made up of listeners / learners, teachers, and the recognition that learning can take place and is taking place in that environment. The majority of the current rural primary schools in Uganda were once without the infrastructure that we now call a classroom, but effective learning still took place and current leaders and academics have passed through this system. The fact that learners attend the listening centres in their school uniforms, with their school bags, books, pens, and pencils is evidence enough that parents, teachers, and above all the learners themselves, have acknowledged that learning is actually taking place and this is their 'school'. In short, we believe a 'classroom' is not necessarily a room in a building, but anywhere learners can come together for instruction and guidance and learn.

In summary

Above all, the other stakeholders' willingness and the ready involvement of community stakeholders in the programme has ensured the success of the pilot over the three-month period. The pilot has proven that radio instruction can be effective if it is backed up with some element of human facilitation and materials. With proper guidance and structure, co-teachers can teach learners and learning can take place anywhere as long as the various stakeholders who are involved recognise it as a learning centre. Our hypothesis that learners can

achieve meaningful literacy competencies outside a school setting through a cost-effective mechanism of delivery thus holds true.

Finally, what's next?

Our first goal is to complete a full year of testing and refining our model with our existing pilot schools. During this time, we will determine whether to move forward with a school-based model, a small enterprise model, or a hybrid model that incentivises primary schools to be more entrepreneurial. In 2022, having made final revisions to our model, we will scale up in selected schools in all nine districts in the Lango sub-region, which will also mean expanding the number of radio stations we're working with.

In 2022, we would like to begin engagement with NGOs working in the language communities to our east and west within Uganda. We want to find Ugandan partner organisations that are interested in initiating early literacy radio education pilots in their language communities in 2023–2024. And as always, we will share our process and products with government and civil society organisations working in language communities throughout Africa, that want to replicate or adapt ideas from our model for their programmes.

Throughout this process, we will work closely with the Ichuli Institute to rigorously evaluate our model to generate evidence on how to effectively teach literacy through the radio.