

## NUMERACY AT SCALE FINDINGS BRIEF

# TAFITA Program in Madagascar

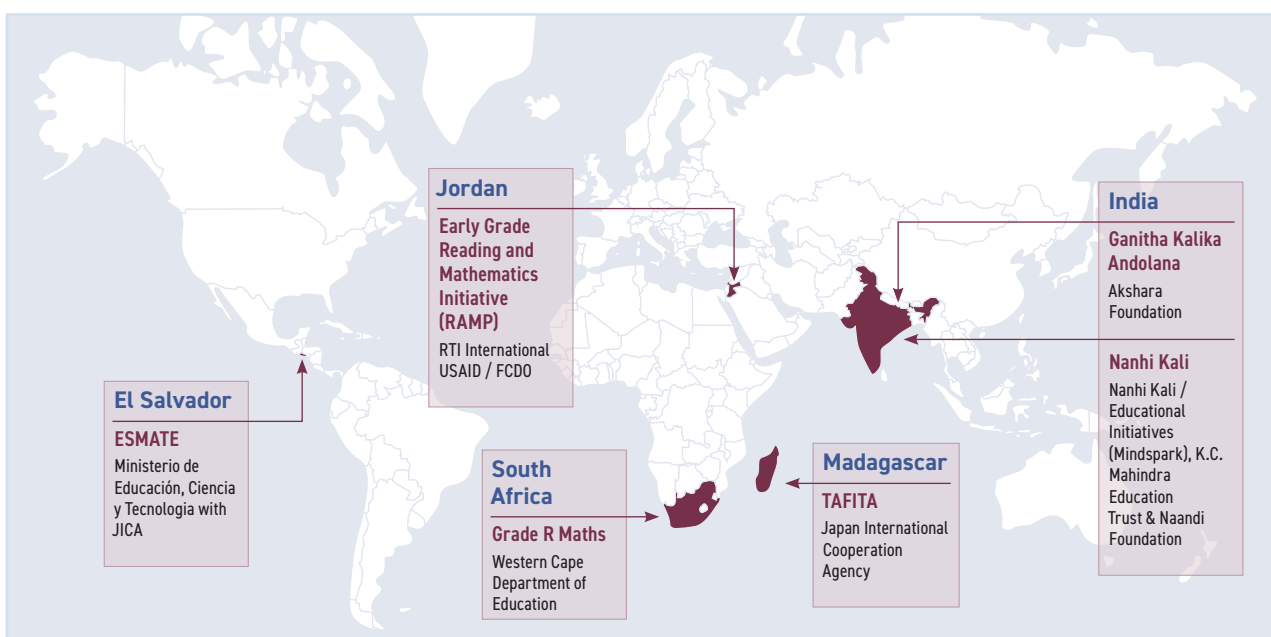


## Introduction to Numeracy at Scale

The Learning at Scale study was designed to explore programs that have a demonstrated impact on foundational learning outcomes at scale. The goal of this research is to identify and examine successful aspects of these programs to provide policy makers and development practitioners with evidence-based strategies for improving instruction and learning outcomes across contexts. The research is led by RTI International and is part of the Center for Global Development education research consortium, funded by the Bill and Melinda Gates Foundation.

While the first phase of Learning at Scale focused on literacy, the second phase, Numeracy at Scale, is focused on (1) identifying instructional strategies that are essential for improving numeracy outcomes at scale in low- and middle-income countries; and (2) learning about the characteristics of the education systems within which successful scaled-up numeracy programs operate. To this end, the study team identified and analyzed six programs across five countries that had rigorous evidence of impact on numeracy learning outcomes and which were operating at scale or which showed the potential for scale in an entire region or country (see Figure 1).

Figure 1. Numeracy at Scale partners



The six Numeracy at Scale programs represent a variety of designs, from providing instruction to at-risk girls via interactive software to a national-scale numeracy initiative integrated into all public primary schools. Despite their differences, these programs share a large number of common elements (see Figure 2).

**Figure 2. Common elements across successful large-scale numeracy programs**



Even with these common elements, these programs provide evidence of multiple pathways to success. For example:

All programs provided teachers with training and support, but the forms that teachers found most impactful for student learning varied.

- In all programs, teachers incorporated independent and group work and focused on building both procedural and conceptual understanding, but their use of materials and student discussion varied.
- Head teachers were trained and relied on the use of data for decision-making, but they differed across programs in how they provided (or sought) support for struggling teachers.
- Coaches or mentors were engaged across programs, but their roles, expectations, and level of support varied greatly.

The remainder of this brief provides an overview of the Numeracy at Scale research methodology generally and explores the findings from one of the programs studied—the TAFITA program in Madagascar.

## ▶▶▶ Numeracy at Scale Research Methodology

The Numeracy at Scale study investigated three main research questions:

- 1 What classroom ingredients (such as teaching practices and classroom environment) lead to learning in programs that are effective at scale?
- 2 What methods of training and support lead to teachers adopting effective classroom practices?
- 3 What system-level support is required to deliver effective training and support to teachers and to promote effective classroom practices?

In addition, cross-cutting questions (based on previous research on mathematics teaching and learning) focused on whether and how teachers emphasized conceptual understanding, the role of representations or conceptual models, and the use of manipulatives or other hands-on activities.

In each country, the study teams carried out a mixed-methods study. See Figure 3 for an overview of the study design.

The data collection in Madagascar was unique, compared to other Numeracy at Scale study sites, in that (1) data were collected from both TAFITA-supported and non-TAFITA-supported schools, which allowed for a comparison sample, and (2) in TAFITA schools, the team collected quantitative and qualitative data from both the after-school Teaching at the Right Level (TaRL) sessions and the regular lessons during the school day. Comparisons discussed in this brief focus primarily on TAFITA lessons versus regular lessons observed in comparison schools. Figure 4 shows the respondents from the data collection in Madagascar.

Figure 3. Numeracy at Scale study design

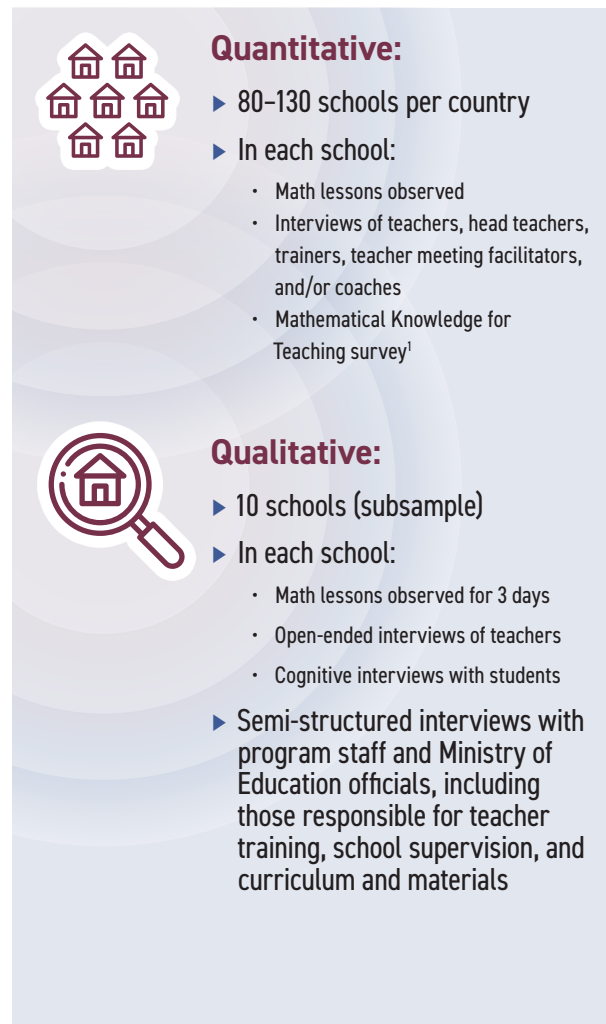


Figure 4. Madagascar study respondents

Respondent	TAFITA	Comparison	Total	
<b>Quantitative</b>				
	Schools	80	50	130
	Teachers	80	50	130
	Head teachers	77	50	127
	District/local officials	50	47	97
<b>Qualitative</b>				
	Schools	5	5	10
	Teachers	5	5	10
	Students	21	23	44
	District/local officials	22	N/A	22
	Region/central officials	11	N/A	11
	Program/partner staff	5	N/A	5

<sup>1</sup> The Mathematics Knowledge for Teaching survey is a short survey (23 items) that measures primary-grade teachers' knowledge of mathematical concepts and their pedagogical content knowledge. For more information, see Wendi Ralaingita, Aizada Mamytova, and Yasmin Sitabkhan, "Capturing Teachers' Mathematical Knowledge for Teaching" (2023), <https://shared.rti.org/content/mathematical-knowledge-teaching-survey-cies-2023-presentation>.

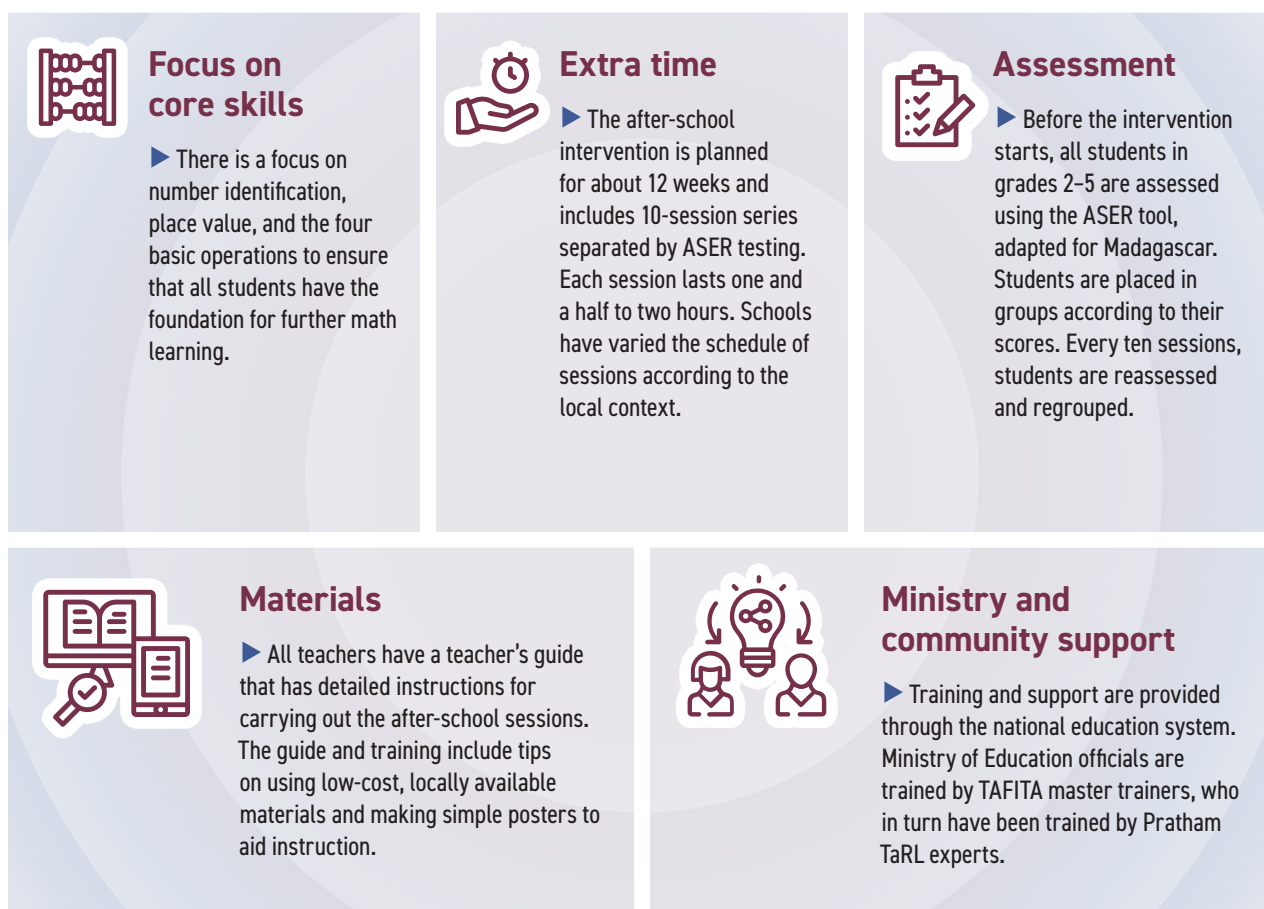
# ▶▶ TAFITA Program Overview

The TAFITA (“**T**antsoroka ho an’ny **F**itantananany sekoly” in Malagasy) program in Madagascar, funded by the Japan International Cooperation Agency (JICA), started in 2016. The program focuses on strengthening the capacity of school management committees to lead extracurricular remedial activities using the TaRL<sup>2</sup> approach. The program includes two main parts: (1) a series of trainings to strengthen the capacity of school management committees (Farimbon’Ezaka ho Fahombiazan’ny Fanabeazana eny Ifotony, or FEFIs) to develop and carry out action plans, including plans for the TaRL remediation activities, through collaboration of parents, teachers and community members; and (2) trainings and ongoing support to local actors to implement the TaRL remediation intervention in reading and mathematics for children in grades 2–5.

TAFITA is being carried out in two phases. Under the first phase (2016–2020), the program was implemented in two regions of Madagascar—Anamalanga and Amoron’i Mania. During the second phase (2020–2024), the FEFI support and TaRL reading portions of the program have been expanded to nine additional regions.

This study looked primarily at the instructional portion of the TAFITA program—that is, the extracurricular TaRL remediation intervention. Key design elements of this remediation intervention, according to a document review and interviews, are shown in Figure 5.<sup>3</sup>

Figure 5. TAFITA remediation intervention: Core elements



2 TaRL is an approach developed by the Indian nongovernmental organization Pratham that focuses on teaching students at their level (based on assessment results rather than grade), typically through out-of-school remediation classes, to help them quickly acquire basic skills. For more information, see <https://www.pratham.org/about/teaching-at-the-right-level/>.

3 The ASER reading and arithmetic tool is a tool of basic skills that was developed by Pratham for use in the Annual Status of Education Report. The tool is a simple assessment of basic number identification and arithmetic skills, which is typically used as part of TaRL to categorize students into four levels according to their performance. For more information, see <https://www.pratham.org/about/teaching-at-the-right-level/>.

## Findings from the TAFITA Program

Findings from the study's qualitative and quantitative interviews in Madagascar reflect similarly positive results as those from TAFITA's earlier impact study.<sup>4</sup> Improvements cited in the interviews with head teachers include better attendance, more active involvement of students, and improved teaching. Teachers also noted that students both enjoyed learning math more and performed better.

The following subsections discuss the findings from TAFITA in relation to the Numeracy at Scale research questions.

### Research Question 1

*What classroom ingredients (such as teaching practices and classroom environment) lead to learning in programs that are effective at scale?*

To understand what instructional practices may be leading to improvements in learning outcomes, the study team analyzed both quantitative and qualitative classroom data, as well as teacher interviews, to identify common themes and to draw comparisons with the comparison schools. Overall, the team did not find substantial differences between regular lessons within TAFITA schools (taught during the school day) and those in comparison schools but did find significant differences between TAFITA lessons (in the after-school program) and regular lessons in comparison schools.

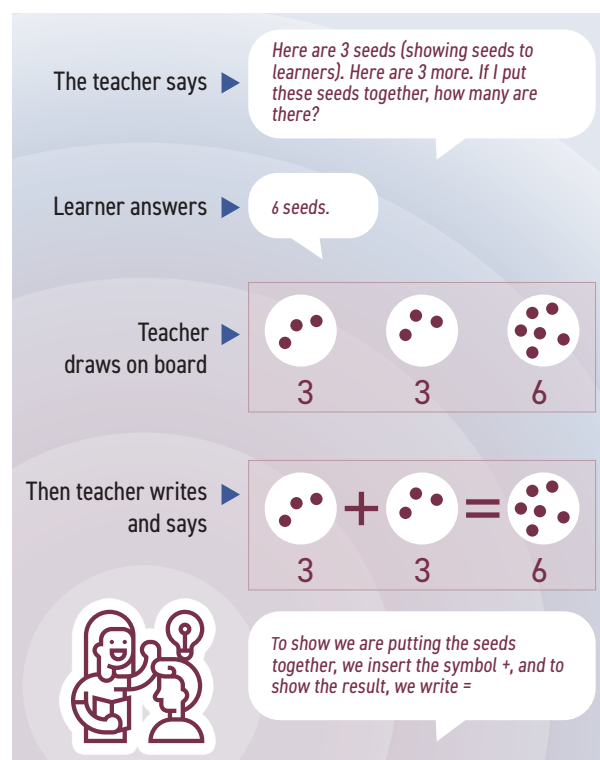
#### **THEME 1** Use of representations and models to support understanding.

In both the TAFITA and the comparison classes, teachers used more than one representation of a concept in their instruction and used models, such as manipulatives, to demonstrate or explain a concept or procedure. For example, TAFITA teachers used concrete materials (such as sticks and bundles of ten sticks); pictures (such as by drawing place value charts and using lines to represent digits); and abstract notation to represent multi-digit numbers. Similarly, during the student interviews, students from both TAFITA and comparison schools used or drew sticks or counters when solving problems.

There were, however, two important ways in which teachers in TAFITA schools differed from those in comparison schools:

- In the qualitative observations, observers noted that TAFITA teachers explicitly linked representations as they moved

Figure 6. Explicitly linking representations of addition



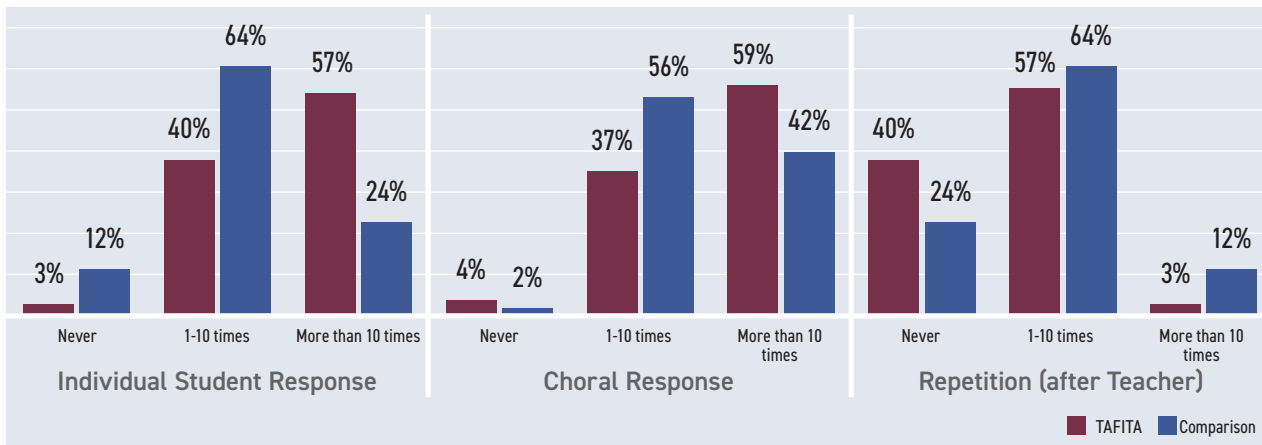
<sup>4</sup> See Takao Maruyama and Kengo Igei. "Community-Wide Support for Primary Students to Improve Foundational Literacy and Numeracy: Empirical Evidence from Madagascar," *Economic Development and Cultural Change* (2023). <https://doi.org/10.1086/726178>

from concrete to pictorial to abstract (see Figure 6 for an example), thus strengthening students' understanding of abstract mathematical concepts. While teachers in comparison classes used some of these same representations, they did not explicitly show how they were linked.

- Students in TAFITA schools were more likely than those in comparison schools to use concrete materials or pictorial representations themselves during practice time, whether alone or as a group (81% of lessons in TAFITA schools versus 41% in comparison schools).

**THEME 2 Student engagement.** Teachers in TAFITA lessons were more likely than teachers in comparison schools to ensure that all students were engaged and had opportunities to participate actively. TAFITA teachers asked questions of individual students, as well as to the whole class, more often than teachers in comparison schools; in contrast, teachers in comparison schools were more likely to have students simply repeat after them (see Figure 7).

**Figure 7. Student responses (% of observed lessons)**



More time was spent on independent or group work in TAFITA lessons (57%) than in lessons in comparison schools (34%). Moreover, in TAFITA lessons, independent or group work was more likely to involve active learning—that is, participating in a project, actively solving a problem, or engaging in game-type practice (45% in TAFITA lessons versus 12% in comparison schools). This was further highlighted in qualitative observations, with examples shown in Figures 8 and 9.

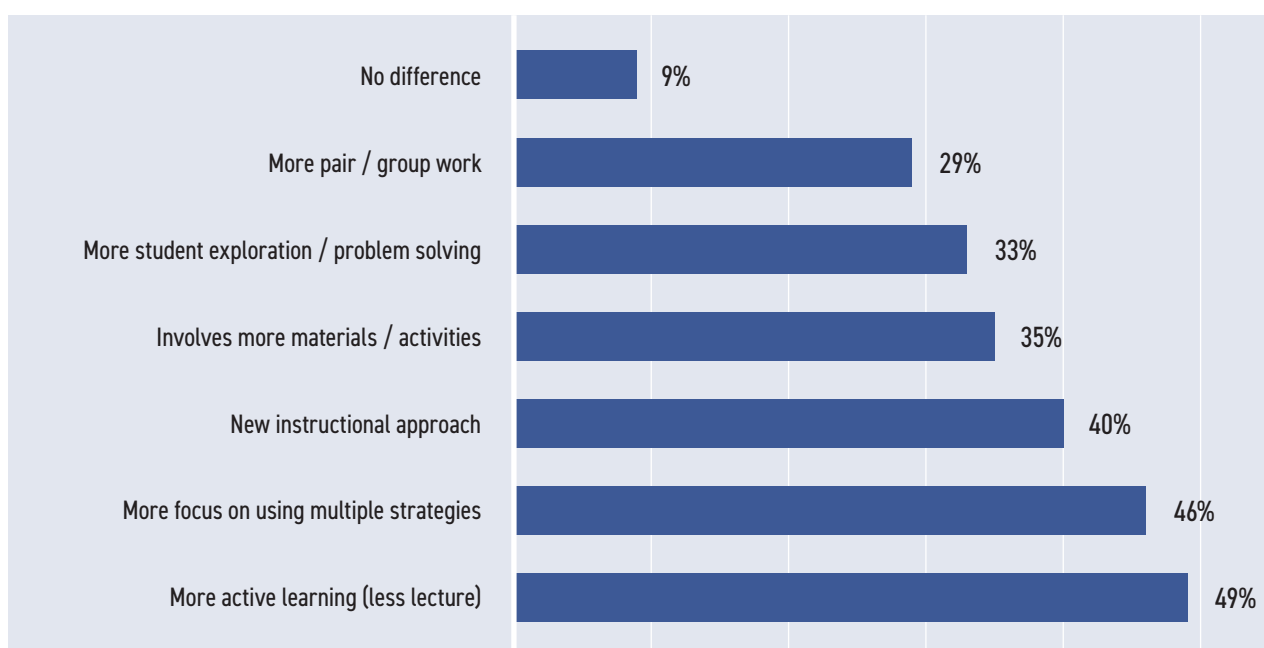
**Figure 8. A group solves problems using sticks, bundles.** **Figure 9. Teacher shows learners how to play a number game and then ensures that all learners get a turn**



**THEME 3 Focus on understanding.** Data from classroom observations indicate an emphasis on ensuring that students develop a conceptual understanding beyond just completing the same problems modeled by the teacher. Teachers in TAFITA lessons were four times more likely than those in comparison schools to ask questions for which there is more than one right answer. TAFITA teachers were also more likely to respond to a student who had given an incorrect answer by helping them reach the correct solution, as opposed to calling on another student or simply saying the correct answer.

These emphases on student engagement and understanding also emerge in the teacher interviews, where TAFITA teachers indicated that the biggest changes in their instruction involved helping students use multiple strategies for problem solving (46%) and more active learning (49%) (see Figure 10).

**Figure 10.** Has your regular class instruction changed since you started working with TAFITA?



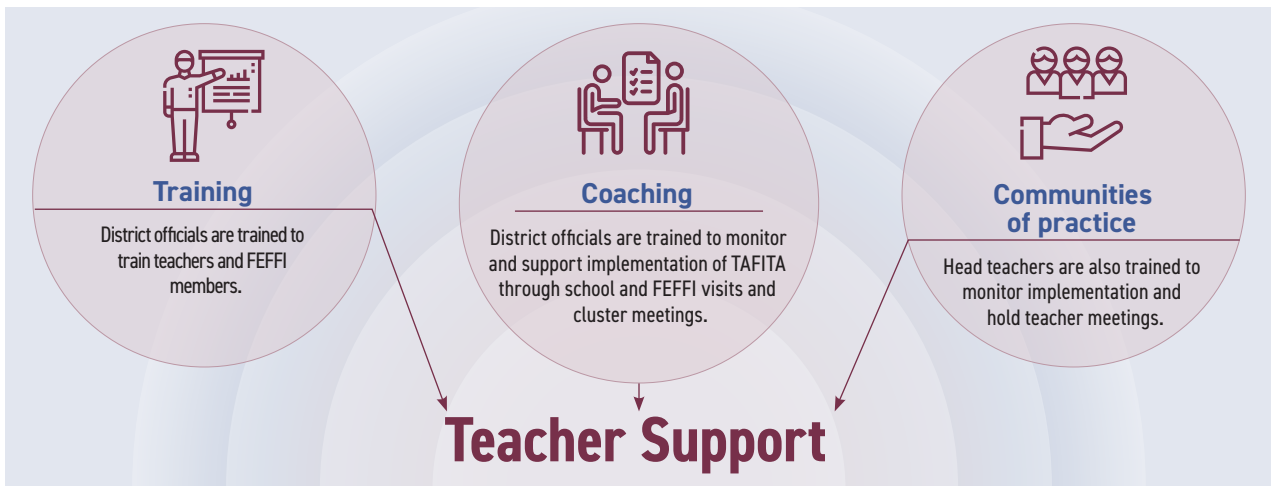
**THEME 4 Assessment-informed instruction.** Assessment did not stand out as a separate theme when analyzing the classroom observation data—60–70% of teachers in both TAFITA lessons and comparison schools checked student work, and there was not obvious use of differentiation within the lesson. However, it must be emphasized that students in the TAFITA lessons had already been organized into groups according to their performance on the ASER assessment, and teachers for each group implemented lessons designed specifically for the target level, in keeping with the teacher’s guide.

## Research Question 2

▶ *What methods of training and support lead to teachers adopting effective classroom practices?*

The TAFITA program model for supporting teachers includes training, coaching, and teacher meetings (see Figure 11).

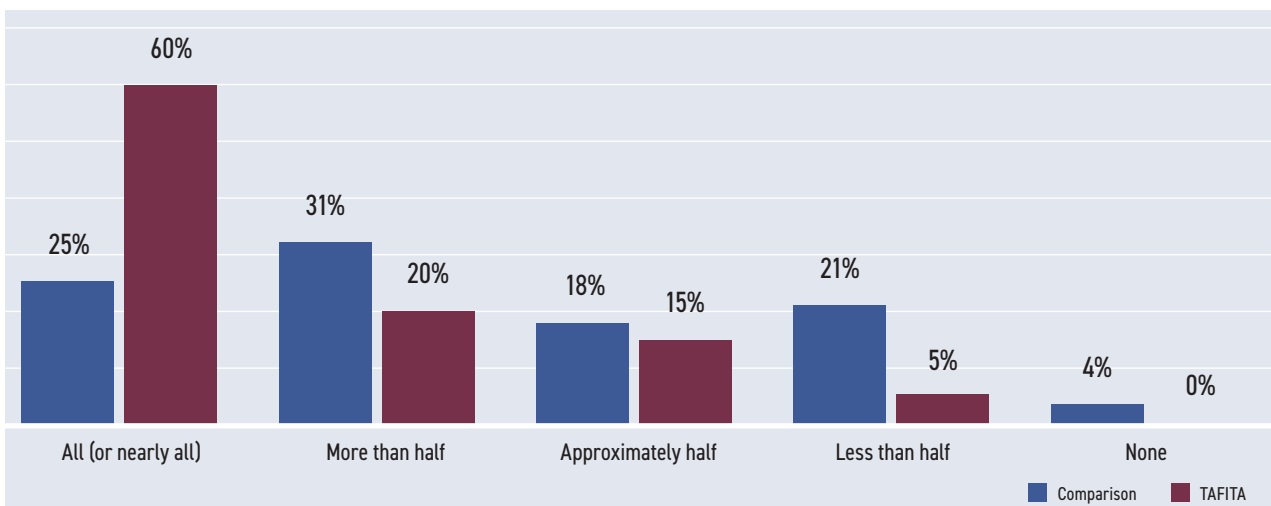
Figure 11. TAFITA teacher support model



Data from interviews with teachers, head teachers, trainers/coaches (district-level pedagogical counselors and chefs ZAP), and other ministry officials reveal how this teacher training and support model has led to successful implementation of the TaRL instructional approach.

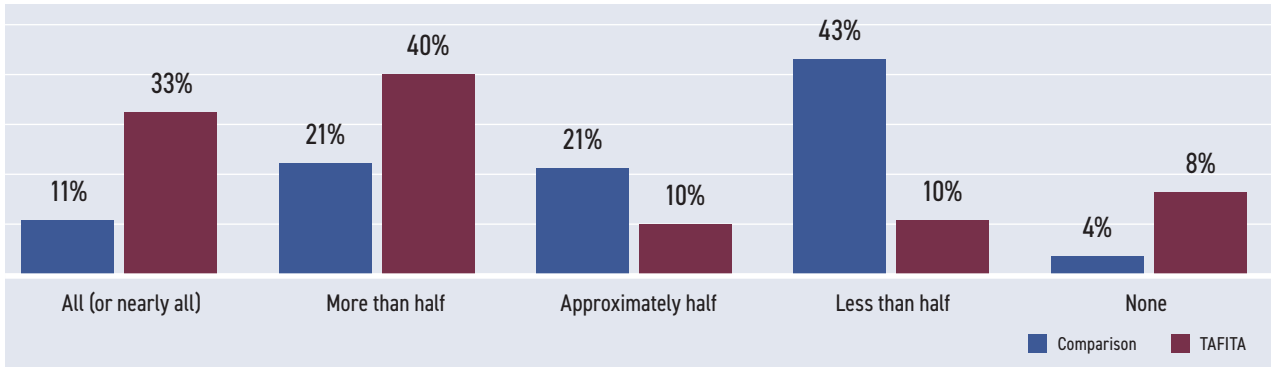
**THEME 1 Training emphasizes modeling and practice over lecturing.** By design, the TAFITA trainings emphasize modeling and demonstration of new instructional practices, as well as ample opportunities for teachers to practice these new skills—approaches that are in line with research evidence on best practices for teacher training. Trainer interviews indicated that teachers in TAFITA trainings are more likely to have opportunities to practice new strategies and to demonstrate strategies to one another (see Figures 12 and 13).

Figure 12. How many teachers practiced implementing instructional activities during training?





**Figure 13. How many teachers demonstrated instructional activities during training?**

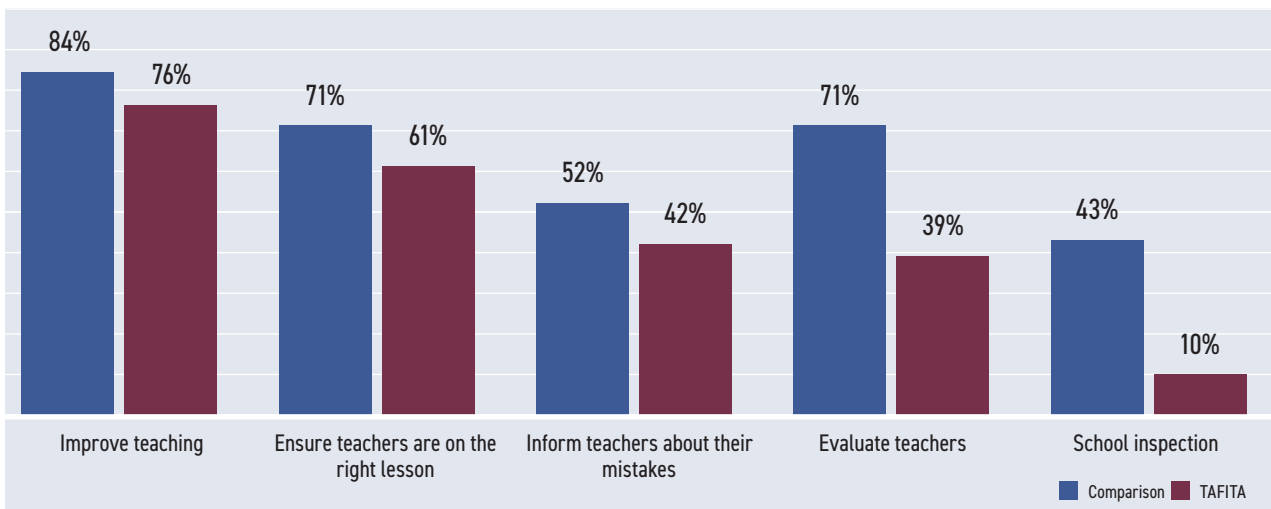


Teachers’ reporting agreed with that of trainers, with teachers indicating that TAFITA trainings integrate more modeling and demonstration, as well as more small- and large-group practice, compared to previous trainings they had attended; the majority of teachers also found these approaches to be the most useful aspect of the training. Head teachers and teachers view the training received as the most important element of the program.

**THEME 2 Ongoing support emphasizes mentoring and coaching over inspection and evaluation.**

Teachers reported that coaches are more supportive than before the TAFITA program and that being able to ask questions about how to improve teaching is an essential form of support. Similarly, TAFITA coaches (pedagogical counselors and chefs ZAP) were far less likely to describe their role as that of evaluation or inspection, compared to coaches in comparison schools (see Figure 14).

**Figure 14. Main purpose of coaching, as reported by coaches**



**THEME 3 Teacher’s guide provides explicit guidance for teachers.**

An additional supportive element for teachers’ instruction under TAFITA is the teacher’s guide, which provides detailed guidance on how to carry out all activities for each lesson across all levels of the program. This includes how to model and teach core concepts, as well as how to carry out practice activities and interactive games that can reinforce skills and provide additional practice. Head teachers and teachers also indicated that the TAFITA teacher’s guide is better organized and easier to follow than previous guides they had used.

## Research Question 3



*What system support is required to deliver effective training and support to teachers and to promote effective classroom practices?*

Coupled with the quantitative data, qualitative interviews with program staff and government officials allowed the study team to develop a portrait of essential systems support elements that have helped promote effective teaching and learning under TAFITA.

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**THEME 1 High-level and local-level buy-in for TAFITA.** The TAFITA program's collaborative approach to adapting the TaRL methods and tools to Madagascar has ensured a high level of buy-in among Ministry of Education officials. In addition, TAFITA has worked to align its remedial classes to the factors that the ministry itself has identified as contributing to low levels of learning (i.e., inadequate instruction time, insufficient availability of materials, and ineffective pedagogy).

Furthermore, TAFITA works with and supports schools and their communities. School management committees (FEFFIs) are seen as essential to mobilizing support from school and local community for improved learning, organizing the introduction of after-school remedial classes, and supporting the monitoring of implementation of the TaRL assessments and instructional methodologies. TAFITA supports an open, democratic approach to school governance and community-based school management, in line with the Ministry of Education's emphasis on the collaboration of local actors to improve education and on enabling more transparent and effective management of resources at the local level.

FEFFI buy-in is an essential component of TAFITA's success. These committees are tasked with developing school improvement plans, which the ministry wants to focus more on improving the quality of teaching and learning. With the introduction of TAFITA, FEFFIs were instructed and supported to include the organization of remedial classes in their school improvement plans as one way to improve quality (addressing the inadequacies mentioned above). Respondents indicated that inclusion of remediation activities in these plans was one of the criteria used to evaluate improvement plans. Thus, inclusion of the remedial approach in school plans helps to ensure funding for its implementation (among other school needs).

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**THEME 2 Implementation through the education system.** Stakeholders in Madagascar attribute TAFITA's success in part to the way in which it collaborates closely with and works directly through the Ministry of Education infrastructure. Actors at each level of the system have clearly defined roles to play in supporting implementation, the priority accorded TAFITA implementation is communicated by the central ministry, and expectations for each actor's contribution to that implementation priority are reinforced by ministry and government authorities at each level.

Key parts of that infrastructure include regional education offices, district education offices (known as CISCOS), and the heads of pedagogical zones (subdistrict clusters of schools). Regional forums were held in each region as the program expanded its implementation footprint—with stakeholders from the regional, district, zone, and school level all invited to participate. The forums focused

on improving learning outcomes and quality in each region. The TaRL-based TAFITA approach was introduced at these meetings and commitments were made by each of the levels to support remediation in all schools in each region.

TAFITA-related training and support functions are fully integrated in the Ministry of Education, with central, regional, and local ministry staff involved in training and ongoing support. Chefs ZAP (heads of pedagogical zones) and pedagogical counselors are trained to train teachers and to carry out school visits to ensure proper implementation of the TaRL approach. Chefs ZAP have motorbikes that enable them to visit schools, although they lack consistent funding for fuel and have concerns regarding their personal safety when visiting schools in remote parts of the country where banditry is prevalent. Interviews with pedagogical counselors and other CISCO officials revealed that they also lack the means to regularly visit schools.

TAFITA also supports the establishment of FEFFI Federations, which are established at ZAP or commune clusters and which support the activities of member FEFFIs and facilitate their experience sharing through the general assemblies. The FEFFI federations represent parent and community interests within their respective localities.

In addition, a FEFFI point of contact on staff in each CISCO and DREN serves as data collection points for monitoring and evaluation. Monitoring data are collected at the school level, picked up from there by chefs ZAP, and then aggregated at the district level by the FEFFI point of contact using a computer and spreadsheet format provided by the TAFITA program. Data from the assessments are shared in regional monitoring meetings. Where students are shown to not be making progress, regional stakeholders discuss what extra support they may need.

TAFITA employs a local nongovernmental organization, SOFIASIVE, to help manage the logistics for trainings, regional forums, and monitoring meetings, and a Japanese consulting firm, Asuka, to provide technical leadership and a three-person team employed in Madagascar and housed within the Ministry of Education. Overall, however, the TAFITA program relies heavily on ministry personnel at all levels to provide training and support to schools and FEFFIs and to conduct monitoring and evaluation.

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**THEME 3** **Joint focus on improving learning outcomes.** Systematic monitoring and evaluation, and the use of data (during district and regional level forums), keep stakeholders engaged in evaluating program implementation. The availability of data showing changes (or lack thereof) in learning outcomes keeps stakeholders and key ministry actors at all levels focused on improved learning. Publicly shared information about implementation progress (during public forums) also serves to maintain the priority on TAFITA. All stakeholders interviewed cited more democratic and transparent local school governance and management with a focus on improving learning outcomes as an important outcome of TAFITA. FEFFIs equipped to develop school improvement plans that include activities to improve the quality of teaching and learning is another important outcome of TAFITA that all stakeholders identified.

The reliance on school-level actors to organize and mobilize the necessary energy and inputs to deliver remedial instruction, and the joint focus on improving learning outcomes, has enabled implementation at scale. Alignment with ministry policy (e.g., by capitalizing on “pedagogical days,”

visits to schools by chefs ZAP, and requirements for school improvement plans) has enabled TAFITA to be implemented without creating parallel structures or requirements.

However, at the local level, community members' efforts and contributions are purely voluntary. Most importantly, the extra time that teachers need to spend conducting remedial classes (outside the normal school day) is also not compensated. Enthusiasm for the approach and positive feedback from seeing improvements in learning outcomes has encouraged and helped maintain some of this voluntary effort, but there is concern among local-level stakeholders regarding how much longer they can continue to do so. The widespread extreme poverty in Madagascar means that teachers and families need to focus on securing their families' livelihoods, thus limiting how much and for how long voluntary effort can sustain TAFITA at the local level.

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## Future Considerations

As discussed above, the analysis undertaken by the study team includes evidence that echoes the positive findings of the previous impact study on the TAFITA program and identifies some of the key elements that appear to be contributing to that success. As the Madagascar government seeks to learn from and expand these impacts, the analysis also highlights some areas that could be considered for further strengthening TAFITA's impact and for potential institutionalization.

### **Institutionalization of TAFITA Pedagogy**

There is little evidence of transfer of pedagogical strategies from TAFITA lessons to regular lessons; however, such a transfer could reduce remediation needs and improve learning across the country. Stakeholders at the central, regional, and local levels all indicated that teachers find the TAFITA instructional methodologies effective and particularly enjoy the level of engagement they see among their students, owing to the student-centered, activity-based nature of the approach. However, when asked, no stakeholders reported having seen teachers transfer the instructional strategies of TAFITA into their regular classroom practice. Qualitative classroom observations indicated that some teachers may be bringing some activities into their regular lessons—three of the five teachers included in the qualitative subsample did so during the observation—but other teachers indicated that they thought they were not supposed to, and these instances were observed only where the lesson topic of the day happened to coincide with some of the skills targeted in the TAFITA program. Similarly, the Mathematical Knowledge for Teaching survey of teachers and cognitive interviews with students, which included items across mathematical domains, did not show significant differences between TAFITA teachers and teachers in comparison schools, which may be in part due to the specific focus on a small set of skills.

Over the longer term, the extent to which TAFITA can influence core instructional practice during the school day could reduce the amount of remedial instruction that eventually may be needed. In addition, helping teachers expand those instructional strategies to other domains could help strengthen mathematics teaching and learning more broadly. However, given the challenging conditions under which most teachers, students, and families are struggling to create educational opportunities for young learners, it is likely that a TAFITA-type remedial program will be needed to support many of Madagascar's primary school students.

## Systemic Institutionalization

An equitable system will demand budgetary allocations sufficient to ensure that all schools and children, particularly in more disadvantaged parts of the country, can receive the instructional support (including remediation) they need.

Several features of TAFITA have contributed to policy and institutional-level changes within the education system in Madagascar. For one, the Ministry of Education intends to scale TAFITA to cover all of the remaining regions in the country. Given limited government resources, expansion is being negotiated with JICA, as well as with other funding agencies and development partners. As the program scales up, with an eye toward sustainability, the ministry and TAFITA's leadership have worked to identify ways to reduce costs (for example, by changing from large regional to smaller, more local forums, and by providing fewer school-level inputs). The expectations for FEFIs to produce school improvement plans that address remediation are built into how the Ministry of Education evaluates school improvement plans and thus approves school grants. The amount of the school capitation grants in many communities does not suffice to cover the costs of remediation and other locally borne school expenses. The government is working to convert contracted teachers to an official status (thus offering them a higher salary and not relying on local payment of their salaries). However, while those conversions are slowly taking place, local communities will continue to struggle to use their funds to cover those salaries.

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Over the longer term, Madagascar will need to increase its education budget, whether through national resources or through external budgetary support. A more equitable system would not rely on poor communities shouldering the costs of basic education. The Ministry of Education will need eventually to provide enough public funding to ensure that all teachers can be paid a living wage and to provide school grants sufficient to cover the costs of needed interventions such as TAFITA remedial classes.

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*Authored by: Wendi Ralaingita, Jonathan Stern, Joe DeStefano, and Yasmin Sitabkhan,*

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