Structured Pedagogy

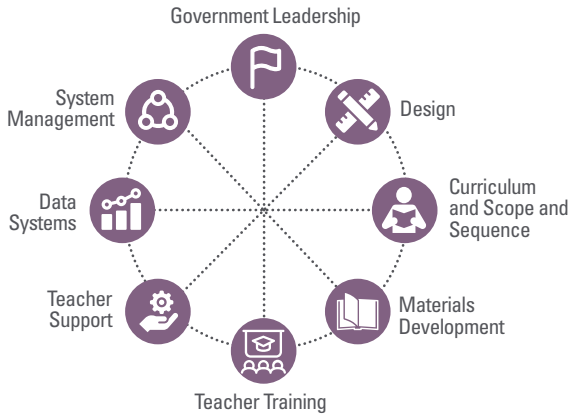
How-To Guides and Literature Review

Learning outcomes in low and middle-income countries are disastrously low. The task of improving foundational literacy and numeracy (FLN) outcomes hinges on raising the quality of teaching and supporting the instructional decision-making of individual teachers- tens of thousands of them in many countries. Structured pedagogy programs have shown an ability to support teachers to make those individual pedagogical decisions at large scale and that those changes can have a meaningfully large impact on learning outcomes.

The term structured pedagogy is broadly defined as **a specifically designed, coherent package of investments that work together to improve classroom teaching.** While structured pedagogy programs are defined by their variation, the typical structured pedagogy program includes key elements which work together to support quality teaching. Key elements of structured pedagogy programs include 1) student books and materials, typically at a 1:1 ratio, 2) teachers' guides that provide daily lesson plans for teachers at various levels of specificity, 3) teacher training organized to reinforce specific skills in teaching the lessons, and 4) ongoing support to teachers implementing the structured pedagogy program, typically including coaching and or communities of practice. Other elements are included in specific structured pedagogy programs, such as assessment results for monitoring program implementation, various technology supports including for teacher coaching, and continuous assessment by teachers.

STRUCTURED PEDAGOGY IS BROADLY DEFINED AS A SPECIFICALLY DESIGNED, COHERENT PACKAGE OF INVESTMENTS THAT WORK TOGETHER TO IMPROVE CLASSROOM TEACHING.

Investments for Successful Structured Pedagogy Programs



Given the potential effectiveness of structured pedagogy programs, this series of guides explores specific tasks essential to effective structured pedagogy interventions. This How-To series is designed to provide practical guidance for donors, policy-makers and implementers on designing and managing effective structured pedagogy programs at-scale. This series provides a step-by-step guide for each of the key elements of a structured pedagogy program. Each guide provides the reader with 1) a list of additional resources to consider; 2) identification of areas where technical expertise is needed; 3) red alerts—something to be aware of and alert to, because it is a common problem—symbolized with this icon ; 4) non-negotiables—a "must-have" for a structured pedagogy program—symbolized with this icon . Each guide presents recommendations for effectively implementing particular elements of structured pedagogy programs in large scale foundational literacy and numeracy programs. The how to guides address the following topics.

1. **Government Leadership and Teacher Adoption**
2. **Designing an Effective Structured Pedagogy Program**
3. **Curriculum and Scope and Sequence Development for Literacy and Numeracy**
4. **Teaching and Learning Materials Development**
5. **Teacher Professional Development: Teacher Training**
6. **Teacher Professional Development: Ongoing Teacher Support**
7. **Data Systems and Accountability**
8. **What Education Leaders Need to Know to Support Structured Pedagogy**

Literature Review on Structured Pedagogy

Structured Pedagogy Can Really Work: A Note for Education Leaders

1 Government Leadership and Teacher Adoption

Effective foundational literacy and numeracy programs need government leadership. This requires listening to government priorities, amplifying the ideas of champions, and using country-specific evidence. Succeeding in these programs requires understanding teacher decision-making and ensuring civil servants' job descriptions and incentives align with program priorities.

2 Designing an Effective Structured Pedagogy Program

Program impact depends on key program design decisions. Effective programs do more by doing less and simplifying the task of improving teacher pedagogy, and they are designed to be scaled up and use evidence of rigorous pilot studies to implement the most effective interventions.

3 Curriculum and Scope and Sequence Development for Literacy and Numeracy

Learn about the expected skills of students, what teachers do well, and expectations for a curriculum adjustment. Decide skills and pacing that aligns with the science through collaboration with the government. Develop a living scope and sequence.

4 Teaching and Learning Materials Development

Ensure that any student materials are engaging, simple, and appropriate to the target grade level. Teacher materials should be closely aligned with student materials, provide scaffolding appropriate to teacher experiences, and have everything needed for a lesson clearly laid out in one place. Do not underestimate the amount of time necessary to develop high quality materials.

5 Teacher Professional Development: Teacher training

Design training programs based on adult learning principles focusing on practical experiences with the content that is immediately relevant to build self-efficacy before teachers enter the classrooms. Plan logistics of larger trainings as far in advance as possible ensuring support to all levels of a training cascade.

6 Teacher Professional Development: Ongoing Teacher Support

Develop and implement a system to ensure that teachers receive ongoing support after they have participated in training. Include multiple touch-points for teachers and ensure that coaches and communities of practice receive enough training and support to help teachers succeed.

7 Data Systems and Accountability

Work with government to embed data systems that promote accessible, rapid feedback on each program component, taking limited resources and varying priorities into account. Communicate findings in a timely manner to ensure accountability, adaptation and a demand for further data and future use.

8 What do Education Leaders Need to Know?

Set and communicate student level outcomes in ways that all stakeholders can understand. Hold the system accountable for providing schools, teachers and students the supports they need to achieve those outcomes.

Literature Review

The literature on structured pedagogy shows that the recent iterations of these programs are in a long of structured pedagogy interventions over the history of education. We find that structured pedagogy programs have shown substantial impacts on learning at medium and large scale, though the substantive impact of these interventions differs by context. We found substantial agreement on particular elements of structured pedagogy programs but that there are several areas that remain unknown and worthy of additional research.

Structured Pedagogy Can Really Work: A Note for Education Leaders

What can education leaders do to achieve dramatic improvements in learning? Use structured pedagogy methods to improve instructional practice, make sure the education system provides the necessary materials, training and ongoing teacher support. The structures and capacity put in place to improve foundational literacy and numeracy can enable an education system to improve teaching and learning across all subjects and grades.

ADVISORY COMMITTEE

The Science of Teaching Advisory Committee includes educational leaders and technical experts representing a range of donors and policy makers. The committee provided guidance during the process of developing the Structured Pedagogy guides, providing feedback on drafts and helping to ensure that the guide series will offer evidence-based, realistic, and actionable information to the international education community.

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Structured Pedagogy

Literature Review

A. Introduction

Learning outcomes are disastrously low for the majority of children in low- and middle-income countries (LMICs). Children are simply not learning enough to acquire basic literacy and numeracy skills, let alone be substantial economic contributors in a modernized economy.[1]There is a tremendous amount of wastage and churn at the lower grades due, in part, to poor management and bad teaching.[2] Shockingly, in some countries, nearly half of the grade 2 population is unable to read a single word of a sentence or do basic numeracy, as Figure 1 shows.[3] Pritchett argued that tiny numbers of students in Cambodia, Senegal, and Zambia were able to read or do mathematics at Programme for International Student Assessment (PISA) Level 4 or higher (i.e., global proficiency).[4] For example, only five students in Zambia and four in Cambodia reached that level. Given these results, several LMICs are suffering from a massive underutilization of human capital; productive members of society are being underserved and tremendous talents are being left behind.[5]

DEFINITIONS

LESSON PLANS = provides the what to teach and the how. Some lesson plans include scripting and some include steps.

SCRIPTED LESSON PLANS = lesson plans that include word for word instructions for teachers on what to say and do.

STRUCTURED PEDAGOGY = a coordinated, combined approach including lesson plans + student materials + training + ongoing support (e.g., coaching).

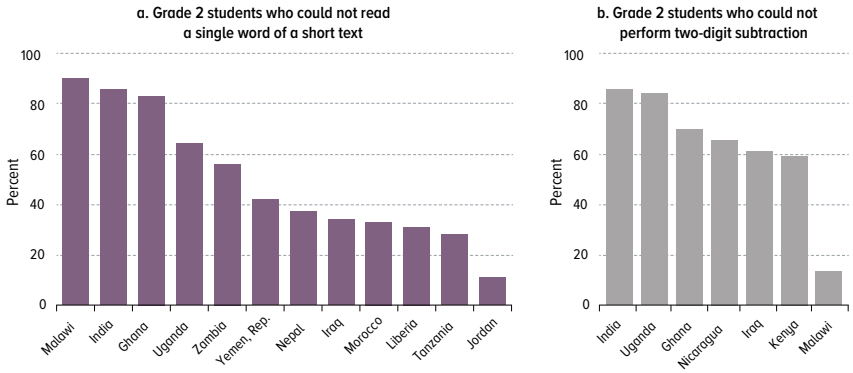
GRADUAL RELEASE = an instructional model whereby the teacher shifts responsibility to the students so they can eventually do the skill independently.

"I DO, WE DO, YOU DO" = a time-limited, direct instructional method of gradual release in which the teacher first models, then does the activity again with the students, and then monitors them as they attempt it alone.

"Structured pedagogy refers to a systemic change in educational content and methods, delivered through comprehensive, coordinated programmes that focus on teaching and learning, with the objective of changing classroom practices to ensure that every child learns."[1]

The World Bank has argued that 53% of children in LMICs are suffering from learning poverty and that this requires urgent action with educational improvement interventions, including structured pedagogy.[6] More striking, 87% of children in sub-Saharan Africa are learning poor. A common explanation for the low learning outcomes was the heavy focus on increasing access to education in LMICs, with some countries like Ethiopia increasing from just over 20% primary access in the early 1990s to nearly 90% about 12 years later.[7] Any system faced with that pace of expansion would suffer from quality concerns. That said, it is misleading to argue that the Education For All movement was only focused on access, as the Education For All documents themselves talked about quality and learning, and Lockheed and Verspoor's key text was focused on improving outcomes.[8]

FIGURE 1 Percentage of grade 2 students who cannot do basic literacy or numeracy skills[5]

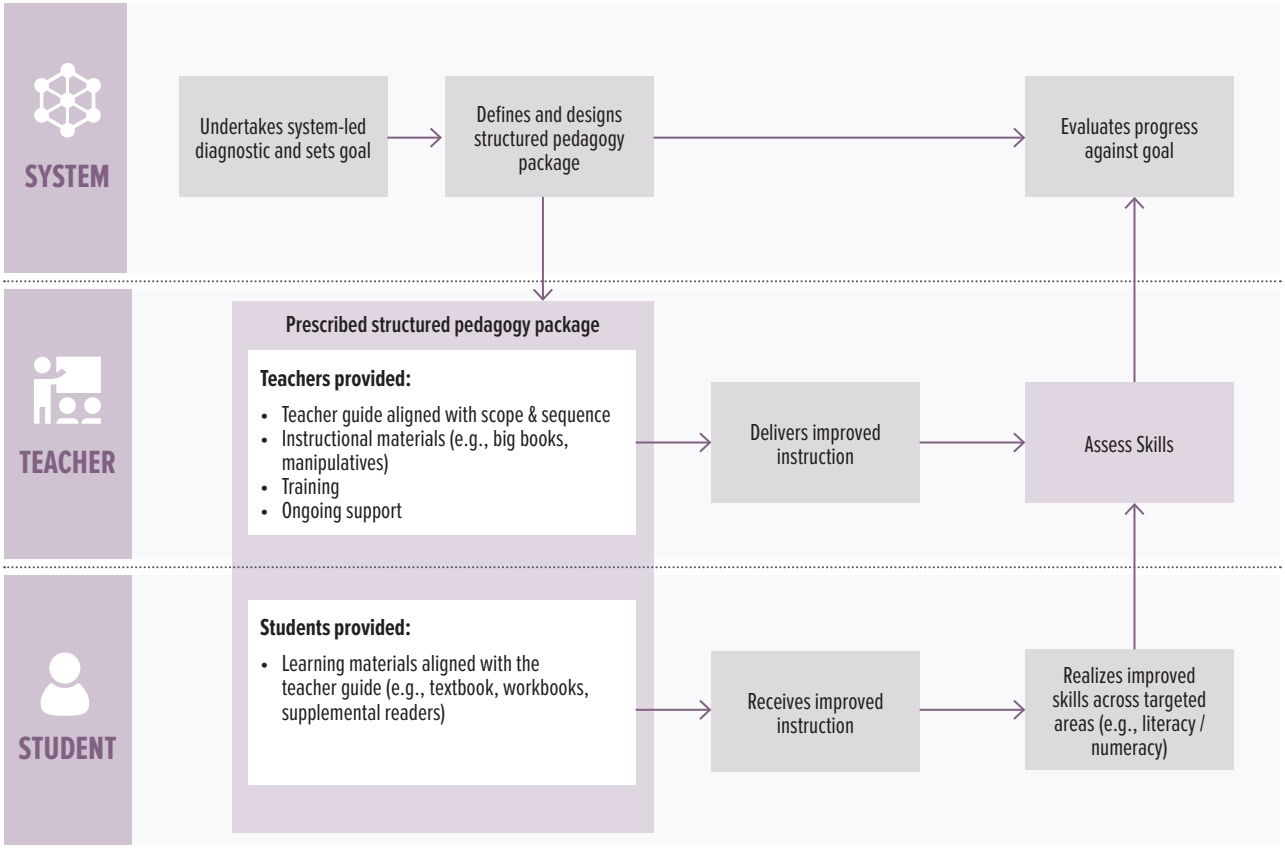


Unfortunately, low learning levels is not an easy problem to solve. At the core of it is poor instructional methods used in a preponderance

of lower primary classrooms. This is due, in part, to a mismatch of the taught curriculum and the skills of children;[9] in part to overutilization of languages of broader communication, such as English;[10] and in part to expectation that it is the curriculum content that should be taught, rather than children.[11] Instructional time is a problem as well,[12] as some estimates suggest that children are disserved by a dramatic underutilization of instructional time due to absence (teacher and student),[13] tardiness, and additional time lost.[14] Some of the problem, though, goes beyond time and systematic issues and relates to simple instructional quality.[15] The heavy repetitive nature of much of instruction in sub-Saharan Africa is ineffective at teaching skills compared with facts,[16] and combined with the limited instructional time in classrooms, it means that many children are struggling due to poor instruction. Teachers in many contexts remain largely impervious to the instructional fads that come and go in education systems,[17] and experimenting at small scale has limited impact at large scale.[18] It is in this context that many governments have been experimenting with various solutions and increasingly focusing on structured pedagogy interventions in foundational literacy and numeracy. **In short, what do we know? Learning outcomes in sub-Saharan Africa are disastrously low and substantial investments are required to improve outcomes at large scale in foundational literacy and numeracy (FLN).**

With these poor learning outcomes, governments seek solutions, and structured pedagogy is a framework to recommend as a means to that improvement. At its most basic, structured pedagogy is a coordinated, combined approach that includes teacher lesson plans, student materials, training, and ongoing support. Successful structured pedagogy relies on the system to ensure coordination among relevant actors (see Figure 2).

FIGURE 2: Defining structured pedagogy



Better Purpose (2020). Structured Pedagogy Roundtable pre-read.

This literature review has the following sections. First, we present a simplified history of recent structured pedagogy. Second, we present key findings from a review of the recent literature on structured pedagogy programs in LMICs. Third, we present important questions to which we do not yet know the answers in this subfield. Fourth, we conclude with links to the other guides in this series for key elements of implementing structured pedagogy.

B. History of Structured Pedagogy

Structured pedagogy has been in use for centuries. From the earliest days of formal education, instructional content has been controlled, with the student content becoming progressively more difficult throughout the school year, and providing teachers with instructional guidance to support student learning. The Ethiopian Orthodox Church used structured approaches to teaching learners the Ge'ez scriptures for hundreds of years.[19] In the 1600s, curriculum materials directed European schoolmasters in what/how to teach.[20] In Germany in the 1830s, the Froebelian approach was highly structured, with explicit instructions and training details.[21] Soon after in the United States, the increase in public-school access created a need for more standardization.[22,23] From 1836 to 1920, McGuffey Readers were widely used and included features that are still recommended today, such as gradual introduction to vocabulary, word repetition, controlled sentence length, and a version of a teacher's guide.[24,25] Horace Mann also responded to the rapid public-school expansion by promoting standardized curricula and instruction but used that influence to advocate whole-word reading instead of by sounds and letter.[26] But by the late 19th century into the early 20th, John Dewey was arguing that content should be more fluid and respond to a student's interest.[27] In the early 1900s, Montessori schools had a highly specified set of activities, materials, and methods.[28] In the 1920s and 1930s, teacher materials suggested activities, ideas for motivating, and discussion points; and by the 1940s, they started to include reproduced student work.[29] In the mid-20th century, Piaget's work on developmental levels became familiar to educators and now serves as a theoretical foundation for new instructional content to be built on existing knowledge. In 1949, the Tyler Rationale was described,[30] which centered on four concepts that persist in today's instructional materials: (1) purpose or objectives, (2) suggested experiences to achieve the objectives, (3) organization for efficiency, and (4) guidance on evaluating learning experiences (i.e., informal assessment). Materials emerged organized around these concepts to accommodate teacher abilities. Many post-colonial education systems in sub-Saharan Africa used various types of basal readers to drive literacy skill development, and pedagogical methods focused on adherence to utilizing these materials on a daily basis.

HISTORY OF STRUCTURED PEDAGOGY

Structured pedagogy has been in use for centuries. From the earliest days, the instructional content has been controlled, becoming progressively more difficult, and providing teachers with instructional guidance to support student learning.

- Pre-1600s Ethiopian Orthodox Church uses structured approach for Ge'ez scriptures
- 1600's European materials direct what/how to teach
- 1830's Frobelian approach
- 1836 to 1920 McGuffey Readers
- 1900s Montessori specified activities, materials, methods
- 1920s to 1940's teaching materials suggest activities
- 1949 the Tyler rational, four curriculum concepts
- 1960's shift from broad to discrete skills
- 1980's Singapore more structured approach
- 1980's discrete skills expand
- 2000's US Reading First funding
- 2006 UK Rose Report
- 2010's curriculums compared
- 2010's Vietnam & China structured approach
- 2019 donors recommend structured pedagogy

In the 1960s instructional materials in the United States shifted from broad to discrete skills.[31] For example, DISTAR was a predecessor to Mathematics Mastery, and Reading Mastery was developed with explicit directions and lengthy scripts, targeting majority minority and low socioeconomic status schools.[32] Soon other publishers created similar materials.[33] In the 1980s, there was movement toward more rigorous school reform, and scopes and sequences evolved from a few specific skills to hundreds of discrete skills.[34] The instructional materials of Success for All were highly structured, and students were grouped by ability. In addition, Success for All included ongoing monitoring and various support mechanisms to help teachers implement the heavily scripted program effectively.[35] In the 1990s, once again, there were efforts to improve education and standards, and charter schools using detailed scripts began to emerge. Structured pedagogy's use in the United States strengthened in the early 2000s following the passage of the No Child Left Behind Act (2002),[36] which required states receiving Reading First funding to have a program that was scientifically based and included the essential components of reading outlined by the US National Reading Panel.[37] This requirement was interpreted as a packaged reading program, and 97% of the funding went to instructional materials and training.[38] At the same time, other national calls for increased standardization and structure were seen in the United Kingdom with the influential Rose Report[39] and in Australia.[40] At the turn of the recent century, under the National Literacy Strategy, the United Kingdom mandated structured pedagogy, and its influence was realized in just four years, when the percentage of students across the country achieving target literacy levels rose 12% (from 62% to 74%).[41] By 2010, nearly two thirds of all U.S. elementary schools

were using a core reading and math program. In the decade since, external comparisons and transparency of curriculum packages are increasingly available.[42,43] From these comparisons, we know that the literacy programs that are most effective are those that provide explicit instruction on the relationship between sounds and symbols systematically. In Singapore, which is often touted for a very strong mathematics program, textbooks were largely imported until the early 1980s. At that point, government officials decided to mandate a more structured approach, creating focal departments within the Ministry of Education to develop and coordinate a national curriculum, including a syllabus; oversee assessment, teaching practices, and teacher's guide development; and develop textbooks.[44] Countries such as China and Vietnam have made substantial progress in national learning outcomes in the past decade using structured instructional approaches.[45] In Shanghai, where schools are recognized for their successful student outcomes,[46] they use many elements of structured pedagogy. The Shanghai model balances structure and autonomy, meaning that teachers put their own touches on the lesson plans that follow a prescribed structure (M. Crawford, personal communication, October 16, 2020).

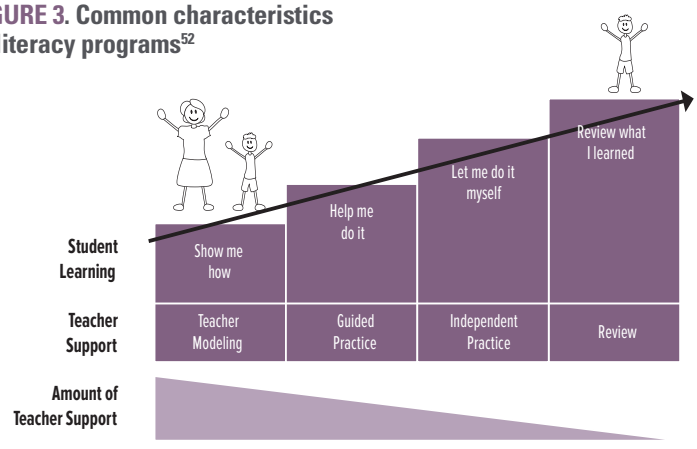
Most recently, structured pedagogy has been described by international scholars[47] and the instructional model recommended by the Global Reading Network[48] for use in international literacy programs funded by the United States Agency for International Development (USAID). Table 1 presents the characteristics of structured pedagogy according to Kim and Davidson.[4950]

Over the past 150 years, the common characteristics that have emerged in teacher's guides used in structured pedagogy include: (1) direct explanation, (2) modeling (i.e., demonstrate), (3) guided practice (i.e., scaffolding), (4) independent practice (i.e., application), (5) formative assessment (6) discussion (i.e., student talk), and (7) monitoring (i.e., attend to student response). Figure 3 presents a graphical display of how these common characteristics looked in literacy programs, comparing how much teacher support was provided and how much children learned in each of these common characteristics.[51] Over the decades, common components such as pacing calendars, daily lesson plans, model lessons, textbooks, teacher editions, student books, supplemental materials, and professional development have been combined to support teachers to improve their instruction. Individual structured pedagogy programs have different combinations of these characteristics and components, and the purpose of this literature review is to describe, in general, how these interventions have worked.[52]

TABLE 1. What is structured pedagogy? Maximizing instructional time[50]

1. Practicing systematic and explicit instruction
2. Establishing instructional routines
3. Providing scaffolding
4. Making assessment-informed decisions
5. Fostering social and emotional learning and engagement

FIGURE 3. Common characteristics of literacy programs[52]



Throughout the history of its use, structured pedagogy has had mixed reactions. Critiques of structured pedagogy in the past have come from both researchers and theorists. For example, those who adhered to Froebel's method were described as "cult-like"; Montessori practices were "ritualized"; while scripted lesson plans have been labeled reductionist or as contributing to deskilling.[53,54,55] Other concerns are that teachers and students are being managed and manipulated with too much teacher talk[56,57] and insufficient autonomy to make judgments. Some leaders in LMICs argue that structured pedagogical programs are neocolonial and that teachers and students should have the opportunity to develop their own instructional pathways, including using teaching to create societal change.[58] Critiques of structured pedagogy are further discussed below under point 11.

Meanwhile the users of these materials, the teachers, often have a more nuanced reaction to the provided materials. Beginning teachers and those new to the subject of math or reading say the materials give them confidence in the content and the appropriate sequencing.[59,60] Most importantly, teachers say they like them because they see their students learning. Plus, the provided content and the suggested activities save them preparation time, freeing them to make adjustments and to be more creative.[61,62] The most typical teacher complaints are that the materials have too much content and do not align with the abilities of all of their students.[63,64]

C. What We Know about Structured Pedagogy in LMICs

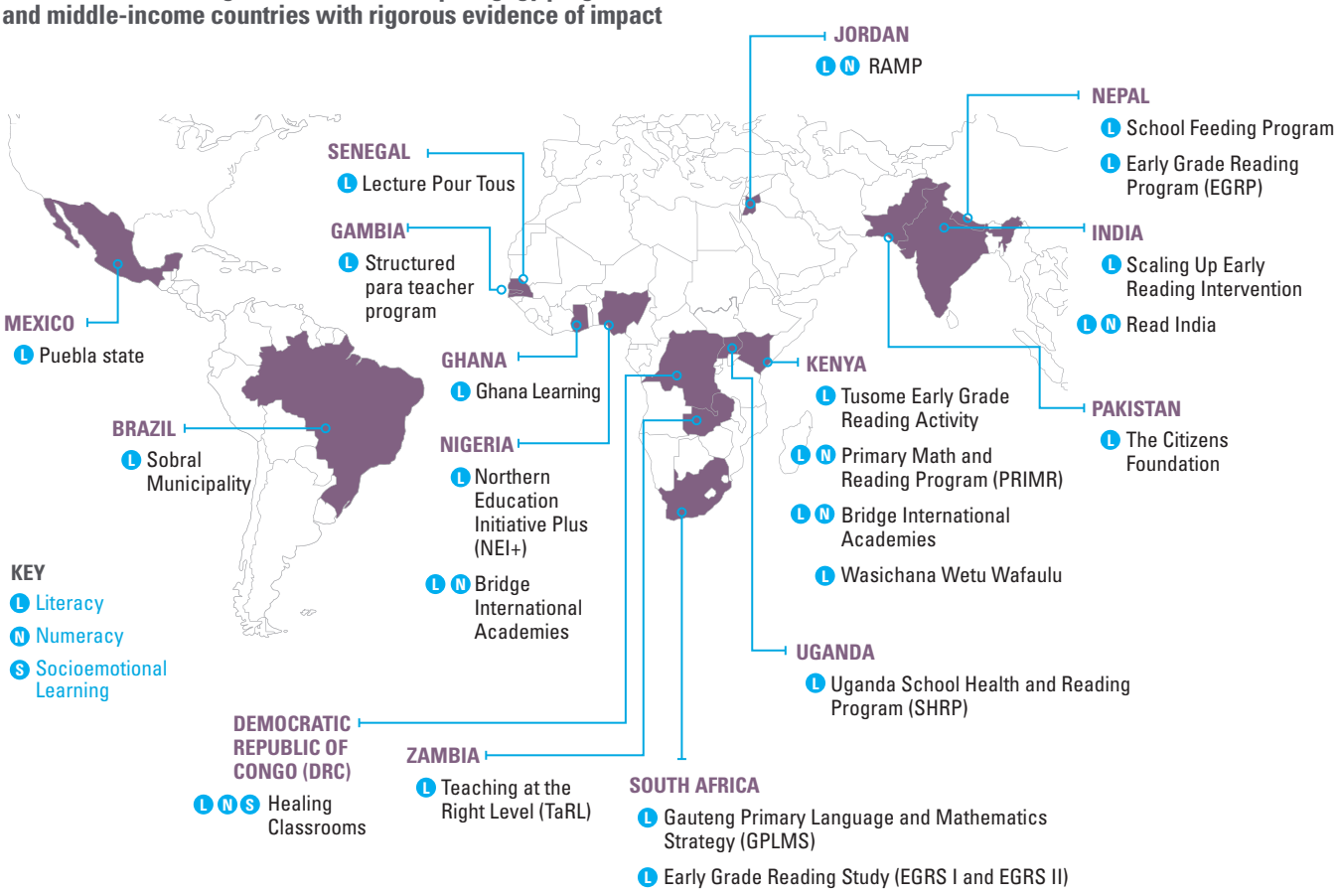
Structured pedagogy programs are relatively recent innovations in LMICs, though not to the education sector more broadly, as we have shown above. The past decade has seen a boom in the rigorous evidence available on structured pedagogy programs in this sector, and we have organized this section of the literature review to present the areas where there is strong evidence regarding structured pedagogy and those areas where the research remains unclear.

1) Structured Pedagogy Programs in LMICs Can Have Large Impacts

Structured pedagogy interventions have been implemented to improve the low learning outcomes described in the Introduction. These interventions build on what is known in how to implement effective FLN interventions from predominantly Western countries outlined above. Figure 4 shows the set of large-scale effective structured pedagogy programs that we are aware of in LMICs. These programs have some design differences, but in general they show substantial impacts on learning. Several meta-analyses show that structured pedagogy programs have substantial impacts on learning outcomes in LMICs[65,66,67,68,69,70,71,72] and sub-Saharan Africa[73] and that these structured pedagogy types of programs have larger impacts on learning than many other alternative technical intervention designs.[74,75]

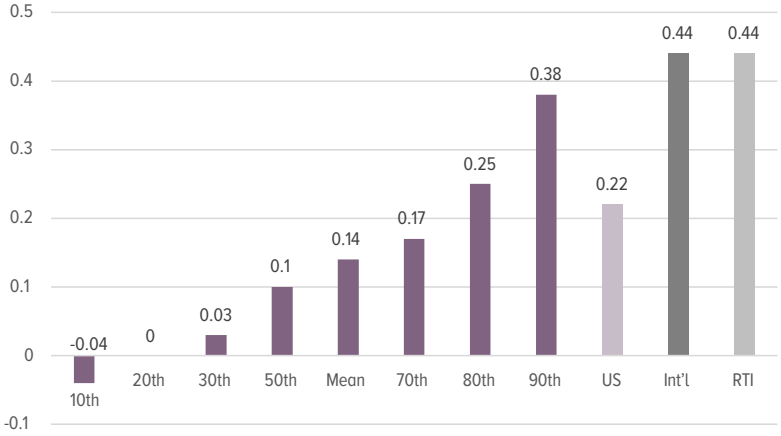
Figure 4 depicts where effective large-scale FLN programs have been implemented. It indicates the country; the name of the program; and whether the program supports literacy, numeracy, literacy and numeracy, socio-emotional learning, or all of those subjects.

FIGURE 4. Recent, large-scale, structured pedagogy programs in low and middle-income countries with rigorous evidence of impact



More work must be done to determine how to interpret the gains from structured pedagogy programs. It is important to determine whether the magnitude of effects identified from structured programs resulted in meaningful impacts (Figure 5).[76,77,78,79,80,81,82] (See endnote 76 for guidance on interpreting effect sizes). We found that, in fact, the magnitude of structured pedagogy impacts was substantial. Figure 5 shows that the average 0.44 effect size independently identified in two recent reviews of recent structured pedagogy programs was larger than the 90th percentile effects of programs implemented in sub-Saharan Africa. More detailed explanations of effect sizes and percentile effects are included in note 76. Two caveats are noted. Not all programs that are characterized as structured pedagogy will necessarily be effective, because design, implementation quality, and buy-in are also necessary; but this evidence provides significant hope that it is possible to improve outcomes. It is also worth noting that large-scale structured pedagogy programs will require time to show impact, potentially several years, given the complexity of the interventions and the multiple moving parts.[83,84,85,86]

FIGURE 5. Effect size comparisons[84,85,86]



The Smart Buys document published by the Global Education Evidence Advisory Panel[87] evaluated programs using Learning Adjusted Years of Schooling (LAYS), rather than effect sizes. LAYS expresses program impacts in additional years of schooling, and the Smart Buys document showed that structured pedagogy programs have substantial impacts, among the largest of any category. Only giving information on the effects of education and teaching at the right level programs have similar or larger average impacts. Some of the structured pedagogy programs the Panel examined were among the most impactful, but also the most cost-effective, in the sector.[88] Several recent meta-analyses have been undertaken to examine the impact of programs,[89,90,91,92,93,94,95,96,97] but only the GEEAP Smart Buys document differentiated structured pedagogy interventions from other activities focused on improving outcomes, and GEEAP argued that structured pedagogy should be considered a Good Buy for policy makers in the sector given its impact and cost-effectiveness. Only Teaching at the Right Level (TaRL) interventions also have similar evidence on improving FLN outcomes at large scale according to GEEAP,[98] and there are substantial overlaps between structured pedagogy and TaRL.

The Learning at Scale study, funded by the Bill and Melinda Gates Foundation with support from the Center for Global Development (2019–2022), was tasked with identifying large-scale, highly effective interventions.[99] The Learning at Scale team worked with donors, implementers, and country counterparts to identify programs that met basic criteria. We noted above that these highly effective programs have been funded primarily by a handful of donors, but more interesting was that seven of the eight programs were structured pedagogy programs. The interim report describing the design and impacts of these programs will be available in early 2021. **In short, what do we know? Structured pedagogy programs can have substantial impacts on learning including at scale.**

2) Structured Pedagogy Programs Can Have Large Effect Sizes That May Mask Small Actual Gains

Although the section above shows that the magnitude of the impacts of structured pedagogy programs can be substantial from an effect size point of view, the apparent impact of some of these programs can be somewhat misleading. It is a vestige of how effect sizes are calculated and the large number of children with learning outcomes that are assessed to be zero. In fact, given the low levels of learning in LMICs, programs with large effect sizes can actually have relatively modest impacts on meaningful learning metrics.[100] In some contexts, structured pedagogy programs can reduce the proportion of children who have very low levels of learning quite substantially, resulting in high effect sizes, but have relatively small impacts on the portion of children who could read or do mathematics successfully before or without the program. This is tautologically in part because of the low levels of initial learning. **In short, what do we know? Structured pedagogy programs have some of the largest impacts on learning outcomes in LMICs, although the practical impacts on learning remain somewhat modest in some countries.**

3) Structured Pedagogy Programs Work in Lower Performing Contexts and to Simplify Complex Skills

Structured pedagogy programs have stronger evidence in particular parts of the education system. For example, the evidence is strong that structured pedagogy programs work in lower-performing contexts. Mourshed, Chijioke, and Barber argued that the structured pedagogy program methods work best in helping education systems move from poor to fair by providing scaffolding for lower skilled educators.[101] With a broader frame applied, we can see that there is evidence of structured pedagogy's effectiveness in both rich countries and LMICs,[102,103,104] although it is worth noting that structured pedagogy programs seem to be more in demand in contexts where there is a perception of low achievement. Structured pedagogy programs also seem to be more frequently utilized when the skills in focus are ones that are foundational to future learning, with lower primary literacy and numeracy being of particular interest.[105,106,107,108,109,110,111,112,113] Teaching children to read is complex, and having a structured program is a potentially impactful intervention in contexts with limited training and low initial qualifications. This theory of the situation is relevant in the United States, as the structured pedagogy evidence is stronger in lower primary education and early childhood education. **In short, what do we know? Structured pedagogy programs have stronger evidence of effectiveness in lower-performing contexts and where the foundational skills required by teachers are particularly complex.**

4) Structured Pedagogy Programs Typically Include Elements that Align with Research on the Science of Learning

The science of learning is an interdisciplinary effort that crosses fields such as cognitive psychology, education, neuroscience, and technology.[114] It consolidates information from controlled environments (e.g., labs) and field research (e.g., classrooms) to inform educational practice. One aspect the science of learning addresses is how humans acquire new knowledge, which is where structured pedagogy aligns with the science. That is, many principles that the science of learning research has detailed[115,116] are realized through structured pedagogy approaches. Table 2 cross-walks the correspondence.

TABLE 2. Relationship between the science of learning research and Structured Pedagogy programs

SCIENCE OF LEARNING	REALIZED IN STRUCTURED PEDAGOGY
Children learn new ideas through connections to what they already know.	A carefully planned scope and sequence (see Guide 3) helps to ensure that students have the prior knowledge they need to master new ideas.
Learning involves moving information from working memory—which has limited capacity—to long-term memory.	Teacher's guides (see Guide 4) offer explanations, modeling, and appropriate examples to avoid overwhelming students.
Solving complex problems requires having basic skills available in long-term memory.	Teacher's guides include instructional methods (e.g., phonics) that ensure students acquire the basics so they can focus on the more complex skills (e.g., comprehension).
Retention of new ideas requires practice.	Learning materials supply content for both initial acquisition and review of those ideas.
Examples help with learning new ideas, but students can still find it difficult to understand the underlying concept.	Learning materials should include both abstract representations (e.g., mathematical calculations) and concrete examples (e.g., word problems).
Gaining new knowledge and skills requires effective feedback to students.	Teacher training (see Guide 5) and ongoing support help teachers to provide constructive feedback.

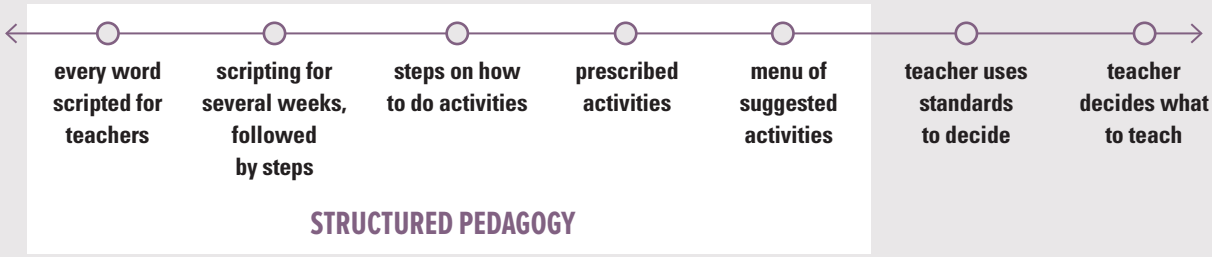
Although structured pedagogy commonly includes elements that are described in the science of learning, program designers should consider including ways to support other areas that also contribute to learning, such as autonomous motivation. Students achieve autonomous motivation by acquiring competency for the task (i.e., self-efficacy, a connection to others (i.e., relatedness), and choice (i.e., autonomy). Structured pedagogy programs focus primarily on ensuring that students can do the task but do not typically address relatedness or autonomy. **In short, what do we know? Structured pedagogy programs include elements that align with the science of learning research but do not include *all* areas.**

5) Structured Programs Are Often Criticized for Reducing Teacher Decision-Making, But Good Structured Pedagogy Programs Expect Teachers to Make Adaptations

Structured pedagogy programs are typically criticized for reducing teacher decision-making and being perceived as teacher proofing. There are some programs for which that is a fair criticism,[117] but the evidence does not suggest that all structured pedagogy programs are overly scripted.[118] Qualitative research from Malawi examined how teachers

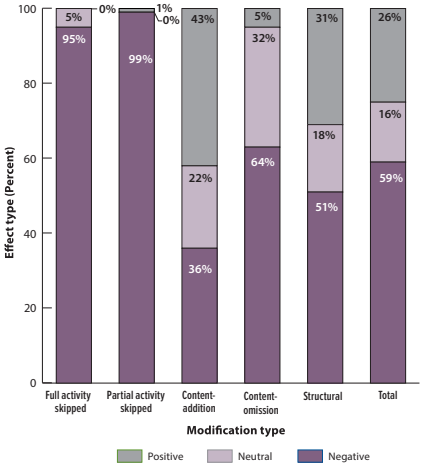
introduced adaptations to lessons, including using continuous assessment results.[119] A multi-country study of teacher's guide utilization in LMICs examined the modifications that teachers made to the teachers' guides and found that most of the changes reduced the quality of the lesson,[120] so we would not recommend adaptations for adaptation's stake. The teacher's guide in the structured pedagogy program should be seen as a scaffold, a support to build the skills of teachers as they grow more comfortable with the pedagogical methods that improve outcomes. See Figure 6 to see where structured pedagogy falls in a continuum of teacher autonomy.

FIGURE 6. Continuum of teacher autonomy



Some programs expect teachers to follow the teachers' guides quite closely, while some programs train teachers on how to make adaptations, how to know when to reteach lessons, and how to build from the frame of the lesson to expand particular programs. The latter method requires more from trainers and teachers. The type of training required to ensure that these adaptations are sound is complicated, but effective structured pedagogy programs should focus on this aspect. It should be noted that some programs do actually provide lesson plans to a level of detail that might be counterproductive, as RTI International's teacher's guide study showed a slight negative relationship between the level of scripting and program impacts.[121] In other words, while having structured materials can make a difference, too much scripting is somewhat counterproductive. Figure 7 shows the findings from the multi-country study of teacher's guide use and the types of changes that were made. That study found that only 26% of classroom modifications away from the teacher's guide lesson plan were positive, and the majority were negative (59%). Although not all teachers followed this pattern, teachers needed more support so that the modifications they made to the teacher's guide lessons improved the lesson. Until that is the case, teachers should be encouraged to follow the lesson plan so that they learn the instruction routines effectively. **In short, what do we know? Structured pedagogy programs should be designed to provide enough guidance to teachers on how to make adaptations.**[122]

FIGURE 7. Percentage of negative modifications[119]



6) Structured Pedagogy Programs Use of Teachers' Guides Can Improve Pedagogical Content Knowledge[118119120121122]

Debates have raged for decades on how best to develop pedagogical content knowledge for teachers.[123] In LMICs, should the professional development programs directly provide new pedagogical content knowledge ideas to teachers? Or should they provide practice and support for implementation of pedagogical changes that require pedagogical content knowledge? The structured pedagogy program experience shows that it is possible to improve pedagogical content knowledge using a focus on instructional behavior and daily teaching rather than a heavy focus on overly complicated pedagogical content knowledge. For example, the Health and Literacy Intervention (HALI) in coastal Kenya provided a teacher's manual with daily lesson plans, training, and ongoing support via text messages. One year of being in the structured program had a large (1.07 SD) effect on teacher knowledge of pedagogy.[124] In another example, the Primary Math and Reading Initiative (PRIMR) mathematics program in Kenya was able to examine the impacts of PRIMR on procedural and conceptual mathematics programs.[125] While not designed primarily to develop conceptual mathematics pedagogical content knowledge among teachers, the program had a 0.33 SD impact on conceptual mathematics for grade 2.

A benefit of structured pedagogy programs has been found in professional development for teachers. These materials support teachers with new content or strengthen their existing knowledge.[126,127] And they are a logical solution to address teachers who may be new to a subject or grade level.[128,129] The model lessons strengthen their delivery and the

planned sequencing helps teachers learn how to anticipate and interpret students' responses or actions for a particular instructional activity.[130,131] (Benefits to teachers are also discussed below under point 7.)

Another key benefit of structured programs is that teachers can more easily build automaticity with lessons and activities. Automaticity is useful because adult brains can only pay attention to a limited number of items or tasks at one time. This is called cognitive load. When the brain has too much load, it will stop processing some items in order to focus on others. Teachers are paying attention to the activity, the materials, student behavior, student learning, and other aspects of the classroom at the same time. If teachers have a more structured lesson plan that is predictable, their brains may focus less on the activity steps and have more space to focus on student learning, the relationship between their pedagogical choices, and how to most effectively improve instruction.[132]

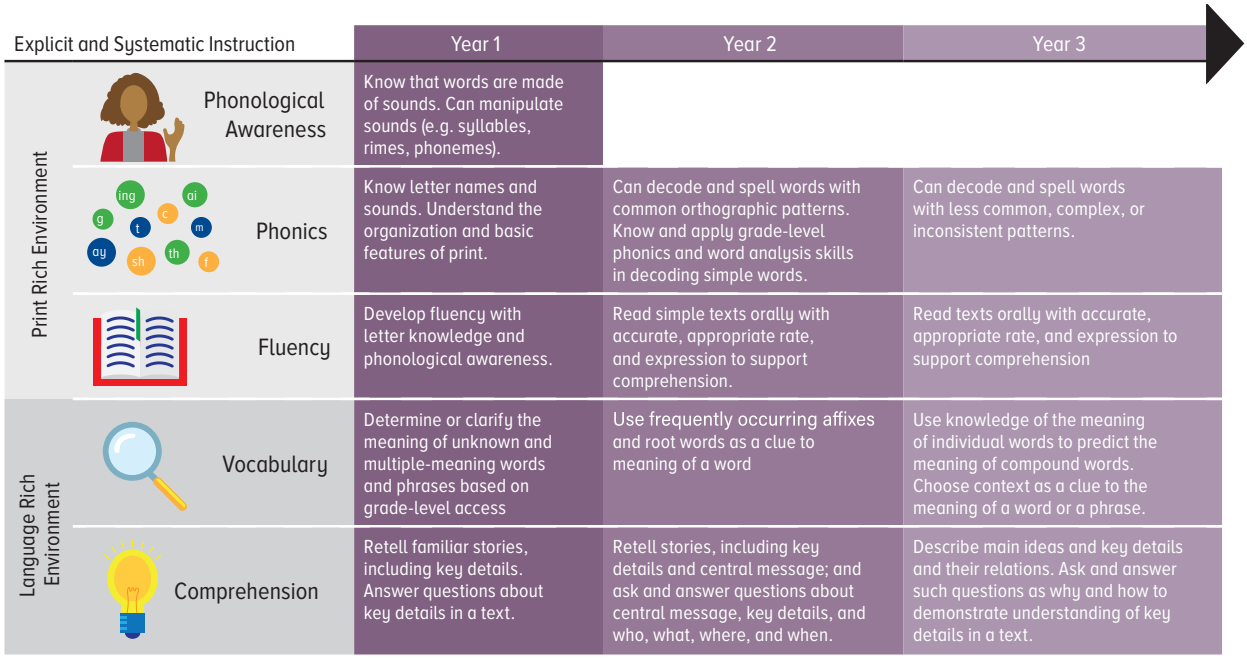
In short, what do we know? Structured pedagogy programs can improve pedagogical content knowledge and increase automaticity, even without primarily focusing on providing that training to teachers explicitly.

7) Structured Pedagogical Programs Require Investments of Technical Skills

Successful structured pedagogical programs require substantial investments in the technical development of the teacher and student materials.[133,134] Simply determining that the country needs lesson plans and student books is not nearly sufficient.[135] In fact, Piper, Sitabkhan, Mejia, and Betts[136] found that the design of the teacher's guide, the relationship to the student books, and the level of pacing inherent in the materials make a difference in the magnitude of the impacts on learning. A study in Mongolia showed that the impacts of books were amplified when implemented alongside a teacher professional development program.[137] Not all of these comparisons between particular elements of reading materials have rigorous evidence, but one study mentioned above suggested a slightly negative relationship between the level of scripting and learning outcomes.[138] The quality of materials seems to matter quite a lot, though it should not be construed to mean that the effectiveness of structured pedagogy is only about materials. Models of quality materials development can guide the sector. For example, several organizations—such as SIL LEAD, Funda Wande, and Room to Read—have been able to develop high-quality materials with government counterparts. We describe in Guide 4, on materials development, how these materials are developed most effectively. It is worth noting here that the skill is not in developing the best materials (student books and corresponding teacher guides), but instead and more importantly, the best materials that can be approved against the existing government curriculum. Those curricula are not always structured in ways that will maximize early learning, so the question is to balance the perfection in those materials with the relationships needed to work with government and with the basic quality characteristics required to make a meaningful impact on learning. Figure 8 presents Kim and Davidson's model for how key skills are developed over the first three years of a structured pedagogy program.[139] And the recently developed Global Proficiency Framework (see Guide 3) can be a resource as it defines the minimum proficiency levels students are expected to obtain from grade one through grade nine for reading and mathematics.

In short, what do we know? Program impacts differ by the quality of structured pedagogy materials, and it requires technical knowledge to write them well and political economy skill to get quality materials approved within a government context.

FIGURE 8. Model of key skills development[137]



Vocabulary and comprehension skills initially develop in the context of an oral language, and continue to develop in the context of reading

8) Structured Pedagogy Program Design Differs by Subject and by Other Characteristics

Structured pedagogy programs have several similarities, which we have described above. They also have some characteristic differences. Structured pedagogy programs differ by subject, as we show in Table 3. There are programs that are literacy only, numeracy only, literacy and socioemotional learning, literacy and numeracy, and literacy, numeracy alongside of social-emotional learning. Because of the growing understanding that socioemotional learning is an important contributor to outcomes in other learning areas, more programs now include social-emotional learning in their design. To ensure that social-emotional learning continues to be included in program designs, more should be done to isolate its influence on academic outcomes as the research is minimal. Note that the subjects that are included in the structured pedagogy program have implementation considerations. Some have been using the "I do, we you, you do" method for literacy[141] as well as numeracy (PRIMR), whereas most math education experts have argued that this linear structure for mathematics is inappropriate.[142] Yet the overarching concept of gradual release (i.e., shifting responsibility from the teacher to students) is relevant to math exploration and other higher-order skills and can be included in a teachers' guide, a hallmark element of structured pedagogy; see Figure 9. Overall, in a structured pedagogy program it is recommended that teachers use direct instruction to introduce new skills (e.g., formal algorithm or the sound of a letter) but what happens after the introduction depends on the specific activity.

There are structured pedagogy programs applied to different levels of the education system. Preprimary and lower primary structured pedagogy programs are most typical, with fewer programs at the upper primary and secondary levels.

TABLE 3. Structured pedagogy programs by program characteristic

PROGRAM CHARACTERISTIC	DESIGN	PROGRAM EXAMPLE	KEY LEARNING
Subject	Literacy only	Ghana Learning	How to implement mother-tongue interventi[143]ons when countries want English
	Numeracy only	Kenya Primary Education Development (PRIEDE) Project	Scaling a multi-subject program with limited training time
	Socioemotional learning's impact on literacy	Healing Classrooms in the Democratic Republic of Congo (DRC)	Statistically significant only at .10 lev[144]el for literacy; no impact on numeracy
	Literacy and numeracy	Gauteng Primary Language and Mathematics Strategy (GPLMS), PRIMR Initiative	A more nuanced understa[145]nding of how to us[146]e gradual release in mathematics
	Literacy and numeracy and social-emotional learning	Ahlan Simsim in Lebanon, Iraq, Lebanon, Syria, and Jordan	Possibilities for meaningful impacts at scale of nurturing care interventions
Level	Pre-primary	Ghana, Tayari[,,]	What learning areas are most [147]likely t[148]o [149]sh[150]ow impacts?
	Lower primary	Many meta-analyses[,,,,,,,]	Most structured pedagogy evidence[151] [152]i[153]n[154] [155]t[156]h[157]e [158]sector comes from this level
	Upper primary	Upper primary brief	Limited evidence of the impacts of struct[159]ured pedagogy in upper primary
	Secondary	Sierra Leone	Effective pilot in Sierra Leone, but smal[160]l scale
Language	Mother tongue only	Nigeria Northern Education Initiative+, Ghana Learning	What about language transi[161]tion?
	Second la[162]nguage only	Ghana Learning add-on; Early Grade Reading Study (EGRS), English[163] second language schools	Are impacts on the second language equita[164]bly distributed?
	Bilingual	Tusome;[,] School Health and Reading Program (SHRP[165])[166]	Integrating the languages is complex
	Tril[167]ingual	PRIMR mother tongue	Not enough time to test how the trilingua[168]l works on language transition
	Late exit bilingual	Reading for Ethiopia's Achievement Developed Technical Assistance (READ TA)	Mother tongue has impacts on learning, bu[169]t what is the relationship with global competitiveness with weak second language skills?

Another question that does seem to have been answered is whether structured pedagogy programs can work using different language choices. There are medium- to large-scale programs that show impacts on learning outcomes that are mother tongue only,[170,171] second language only, bilingual,[172,173] trilingual,[174,175] and even late-exit bilingual.[176] The effectiveness of the late-exit bilingual interventions at scale seems to be somewhat contested, however, as the experience with some literacy programs as they transition to upper primary calls into question whether the structured pedagogy interventions did enough in the early years to prepare for the transition year. **In short, what do we know? Structured pedagogy programs have proven to be relatively durable in their impacts, with several showing impacts across various subjects, across various levels, and across various language designs. Some of these evidence areas are weaker, however.**

FIGURE 9. Gradual release with higher-order skills

Literacy Writing Process

WEEK 1: Teacher models planning and drafting, then plans and drafts a writing piece with students

WEEK 2: Teacher models revising, then revises a writing piece with students

WEEK 3: Students plan, draft and revise a writing piece independently

Numeracy Routine

1. Teacher presents a problem
2. Students work on it independently or with partners
3. Students explain their solutions and discuss a wrong answer and why it is wrong
4. Teacher summarizes models discussed, condensing explanations for other students to use
5. Students are assigned similar additional problems to do alone, with the teacher monitoring

9) Structured Pedagogy Research Has Given Some Guidance on What Ingredients Are Necessary

If we knew what ingredients of structured pedagogy programs were most essential to improve learning outcomes, it would be substantially easier and more cost-effective to implement. It might be that programs are implementing a wide range of program components, not all of which are needed. Fortunately, some work on program ingredients for structured pedagogy programs is available. Table 4 presents some of the summaries of that work. A randomized controlled trial in Mongolia showed small to negligible impacts of books and teacher training alone, respectively, but meaningful impacts on learning from books and training together.[177] Based on the Kenya PRIMR study, adding textbooks to training with coaching mattered, and the biggest additional impacts came from adding teacher's guides with lesson plans.[178] The EGRS contributed knowledge about what type of coaching model works best.[179,180] Fleisch argued that the "triple cocktail" comprises the essential ingredients of program materials, including structured materials with lesson plans, teacher training, and coaching.[181] The mixed-methods EGRS showed that coaching had to be included in the program ingredients, because the impacts were larger and more cost-effective with coaching costs included. The field of researchers and implementers has not created all the possible combinations of ingredients, but there has been consensus on some things in the sector. The relative importance of assessment as an ingredient in structured pedagogy programs remains unclear, because many programs include either learning outcomes evidence or continuous assessment by teachers in the intervention design. **In short, what do we know? Many successful structured pedagogy interventions include some combination of student materials, teachers' guides, teacher training, and teacher support such as coaching**.

TABLE 4. Program ingredients and findings

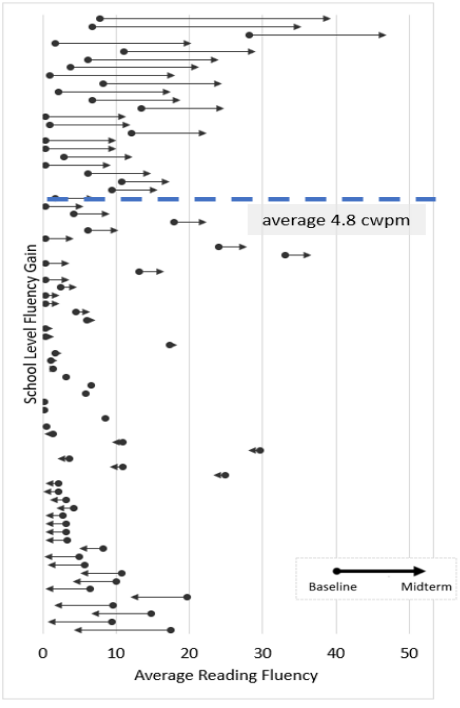
STUDY	INGREDIENTS TESTED	KEY LEARNING
Kenya PRIMR ingredients	Training with coaching, + new[182] textbooks, + teacher's guides	Textbooks matter, but teacher's guides make a big difference
Kakuma refugee camp	English only or English + Ki[183]swahili	English makes a difference, but Kiswahili is also effective
Kenya PRIMR Information and Communication Technology (ICT)	Tablets for coaches, tablets [184]for teachers, e-readers for students	Tablets for coaches are just as effective as tablets for teachers and e-readers for students, and more cost-effective
Experimental evidence from Mongolia	Books only, teacher training [185]only, books and training together	Books and training have negligible impacts on outcomes alone, but substantial gains together
EGRS	Lesson plans and learning mat[186]erials compared with lesson plans, learning materials and coaching	Randomized controlled trial evidence suggested that the program that included coaching was more effective and more cost effective
EGRS	Materials and on-site face to face coaching compared with materials and v[187]irtual coaching	Initial results showed that a[188] virtual coaching model was no less effective than on-site coaching, but longer-term results showed that face-to-face coaching had more enduring impacts

10) Structured Pedagogy Program Impacts Depend on Implementation

Section 1 above suggests that the average effects of structured pedagogy programs can be substantial. These average outcomes mask significant variation. The evidence suggests that these programs are not a magic elixir, and some interventions might not work at all. The Gates Foundation Learning at Scale researchers found that although many donors aimed to improve learning outcomes, including using structured pedagogy methods, some large donors had no programs that achieved meaningful impacts on learning at scale. Some of these programs did not have publicly available data, but it was notable that none of the interventions funded by the World Bank or the Global Partnership for Education had meaningful enough impacts on learning to be considered for Learning at Scale research.[189] This finding suggests that although structured pedagogy programs can work, it is how they are implemented that determines that impact.

Many would argue, of course, that the quality of structured pedagogy programs and their implementation fidelity work together, because programs that are more effective are more likely to be adhered to. Some initial evidence indicates that the main difference between programs that have substantial average impacts on learning and those that do not is primarily the proportion of schools that actually implement the program consistently. For example, at midline, the Nepal Early Grade Reading Program (EGRP), which used structured pedagogy methods, found that the gains came primarily from about one-third to one-half of the schools,[190] while another one-third of schools did not show any gains (Figure 10). A small follow-up qualitative study indicated that the schools that showed the most gains, compared to those that did not show any, were those that implemented more of the program as expected.[191] On the other hand, Piper, DeStefano, Kinyanjui, and Ong'ele[192] found that the Tusome program in Kenya saw more than 80% of teachers consistently teaching the lessons nearly 80% of the time. Implementation quality, in addition to the design of learning materials and the effectiveness of training, likely was largely responsible for the meaningful gains in the country.[193]

FIGURE 10. Nepal Early Grade Reading Program, school-level changes, 2016–2018[192]



In addition to the proportion of teachers and schools that were consistently implementing, implementation fidelity was a critical aspect of program impact. The Ghana Learning intervention in literacy focused heavily on implementation fidelity. The Ghana Learning evaluation showed how implementation fidelity in the Ghana Learning program changed from baseline to midline to endline across four key metrics. The Ghana Learning treatment group substantially increased the use of student textbooks, scripted lesson plans, and teachers' guides,

compared to the comparison group, between the baseline and endline. On the other hand, the treatment group did not focus on workbooks, and utilization of those materials declined.[194] This experience in Ghana shows that it is possible to work toward substantial implementation fidelity at large scale and that with a heavy focus on a few key behaviors, it is possible to support teachers in the teacher behavior change process and impact learning. **In short, what do we know? Structured pedagogy program impact depends on implementation fidelity and program take-up by teachers. It is not a magic elixir and requires an emphasis on effective implementation.**

11) Structured Pedagogy Programs Have Critics

Structured pedagogy programs have substantial impacts on learning, as we have shown, but they sometimes face resistance. A teachers' union conglomerate organization has been critical of one particular group of schools in part because of their utilization of heavily scripted lesson plans provided on tablets.[197] The issues raised in other countries have included concerns about teacher-proofing and the views that these programs de-professionalized their work.[198] As the Kenyan government rolled out its new curriculum in 2019, it chose to reduce the number of lessons for English and Kiswahili, which had the effect of reducing the instructional time available for an effective structured pedagogy program. Sometimes the resistance comes from unions, sometimes it comes from curriculum bodies, and sometimes from the core ministry. In some cases, the resistance is related to concerns that structured pedagogy programs are developed in the West and forced on LMICs without consideration of these contexts and the potential for cultural imperialist tendencies. Responding to these critiques is a task essential to ensuring structured pedagogy impacts, and sometimes understanding the valid concerns of these stakeholders can substantially improve the quality of the program. **In short, what do we know? Structured pedagogy programs have been resisted in many contexts for a variety of reasons. To be effective, some structured pedagogy programs can improve by responding to the valid concerns of stakeholders and by revising the program structure accordingly, while others may have to advocate for program components that are deemed essential.**

D. What We Don't Know About Structured Programs in LMICs

This section presents what we do not yet know about structured pedagogy programs in LMICs.

1) Should Structured Pedagogy Programs Be a Short-Term Scaffold or a Long-Term Support System?

Mourshed, Chijioke, and Barber[199] suggested that structured pedagogy programs are appropriate to raise instructional outcomes from poor to fair, based on the idea that having tight control of teaching and learning is essential to improve performance at these levels. We believe that there will continue to be a need for ongoing alignment among learning materials, teacher training, and support, but it remains to be seen how long teachers will benefit from the current teacher's guide. It takes substantial time and effort for teachers to learn and become proficient in the new pedagogical skills and pedagogical content knowledge required to effectively implement structured pedagogy programs. It may be that teachers need to continue to support teachers as they move through the change process. Given the statistically significant and substantively meaningful impacts of structured pedagogy programs across many LMICs, it is worth examining more deeply whether the teacher's guides and lesson plans should only be provided as a short-term scaffold for struggling education systems and for particularly complex skills, or, whether the combined structured pedagogy program should be a long-term support system for countries needing to focus on improving learning. A way to continue to provide structured pedagogy as teacher skills increase is to adjust the level of autonomy they have in the teacher guide. (see Figure 6). The evidence on what happens in the years after five years of a relatively nascent intervention is relatively limited. We have typically seen program effects plateau at a certain level, and in that case, it might not be logical to continue to invest in interventions whose impacts will level out. Many countries in sub-Saharan Africa are moving toward skills- or competency-based curricula, which have a much higher expectation of how much knowledge will be created by the learner and therefore might have a more difficult time implementing structured pedagogy programs, depending on the countries' understanding and implementation of these programs.[200] On the other hand, one could make the case that the magnitude of the effects on learning from structured pedagogy suggest that they should be expanded and continued. Beginning teachers and those who are tasked with teaching a subject for which they have no pedagogical content knowledge will continue to value structured pedagogy programs, for example. And their voices

should always be included by those who are designing and considering adjustments. An ideal method to determine whether structured pedagogy programs might no longer be required would be to dramatically improve the quality of pre-service training so that teachers are better equipped with pedagogical skills and the ability to respond to formative assessment to redesign their pedagogical techniques and pacing.

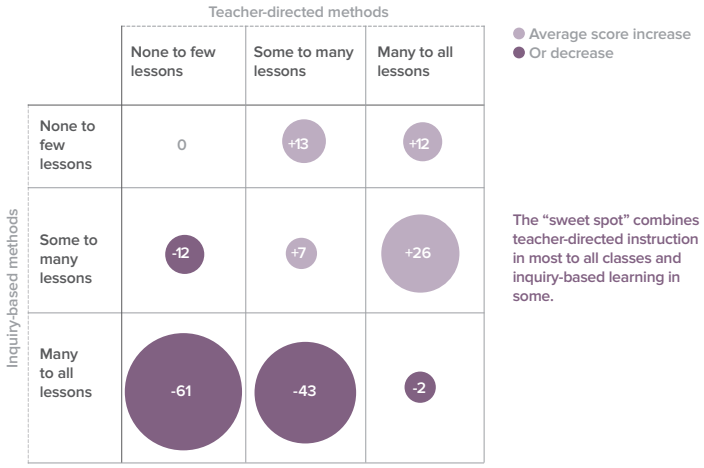
2) Can Structured Pedagogy Programs Be as Effective Beyond Lower Primary?

The vast majority of structured pedagogy programs that this guide addresses are in lower primary or preprimary education. There has simply been less done to examine whether structured pedagogy programs could work in upper primary, which we mentioned above.[201] Some of the existing lower primary programs have spilled over into grade 4 as a transition year, with mixed results in Uganda and Philippines.

Although we described above some structured pedagogy programs in upper primary and secondary interventions, the evidence remains limited as to whether structured pedagogy programs can be as effective in upper primary and secondary levels. These programs provide important technical supports to teachers who lack the skills needed to design carefully organized instructional programs on their own. The investment required to develop structured pedagogy programs across the subject areas might be substantial and raise questions of sustainability, though this viewpoint depends on an understanding of whether not investments on structured pedagogy need to remain substantial or whether the costs of the work and funding required to set up coaching and support systems would decline over time. With content-focused instructional programs, a structured pedagogy program might be less appropriate. Some would argue that a focus on content might be foolhardy, and instead, upper primary should look at the skills teachers need.

The question about the place of structured pedagogy remains outstanding in secondary school in LMICs as well, and although the United Kingdom Department for International Development-funded Sierra Leone Leh Wi Lan program[202] has suggested that structured pedagogy can work in literacy, numeracy, and science in secondary school, it is unclear how transferable these experiences might be within the varied contexts in this region. On the other hand, given that upper primary and secondary typically have far less language complexity, based on government language-of-instruction policies, it might be simpler to develop these learning materials than those in lower primary. Mourshed, Krawitz, and Dorn used PISA secondary school science results (see Figure 11) to suggest that a combination of teacher-directed methods in "many to all" lessons with inquiry-based methods for "some to many" lessons was associated with the highest gains in average scores on PISA.[203] This study did not make causal claims, however, and without clearer rigorous evidence, the relationship between secondary outcomes and structured pedagogy programs remains to be seen. Their findings call into question the assumption that inquiry-based instruction is necessarily more effective, because its impact depends largely on the skill levels of teachers using those methods.

FIGURE 11. Teacher-directed and inquiry-based methods and impacts on learning outcomes[201]

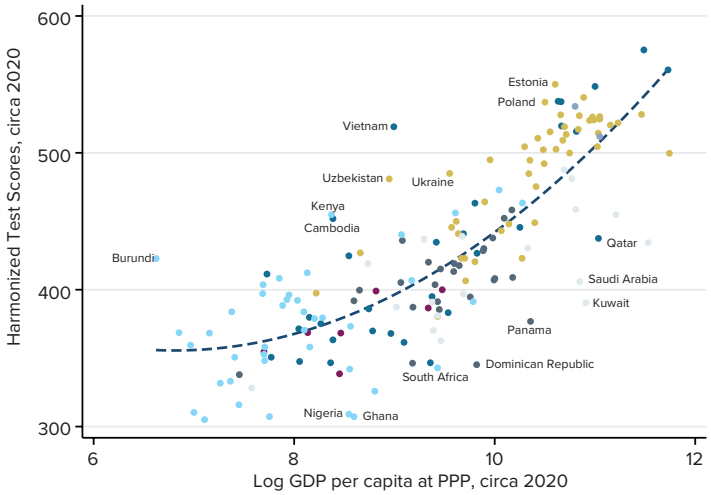


3) What Are the Long-Term Human Capital Impacts of Structured Pedagogy Programs?

The World Bank recently updated its human capital index.[205] Figure 12 presents the relationship between gross domestic product (GDP) per capita and harmonized test scores and reminds us of the human capital improvements required in sub-Saharan Africa, because the majority of subSaharan Africa countries have substantially lower learning outcomes than the rest of the countries with data. This analysis was not able to determine the causal direction—namely, whether the gains in human capital would cause increases in GDP per capita, or vice versa. The assumption underpinning the education part of this work is not controversial; the field has accepted as a given that increased learning outcomes will result in human capital creation, which will have a close relationship with increased economic productivity in LMICs.[206] This assumption is based on several key assumptions. First, the additional skills that structured pedagogy programs afford will be what the higher levels of education accept as key and important through the primary and secondary examination barriers. Second, the gains achieved by young learners benefiting from structured pedagogy programs will persist throughout their education lifespan. Third, the relationship between education outcomes and economic productivity is robust to many of the recent criticisms.

Note that these questions are not specific to structured pedagogy, but to the entire subsector of primary education. The relationship between these scores and GDP is not as predictive as Figure 12, and there are more sub-Saharan Africa outliers, such as Kenya and Burundi, whose test scores are higher than their GDP would predict, while Nigeria and Ghana and South Africa underperform. Might it be possible to improve these scores through structured pedagogy interventions and have a resultant impact on GDP, and if so, what is the lag time between those improvements? These are open questions for future research. [207]

FIGURE 12. GDP and learning outcomes[204]



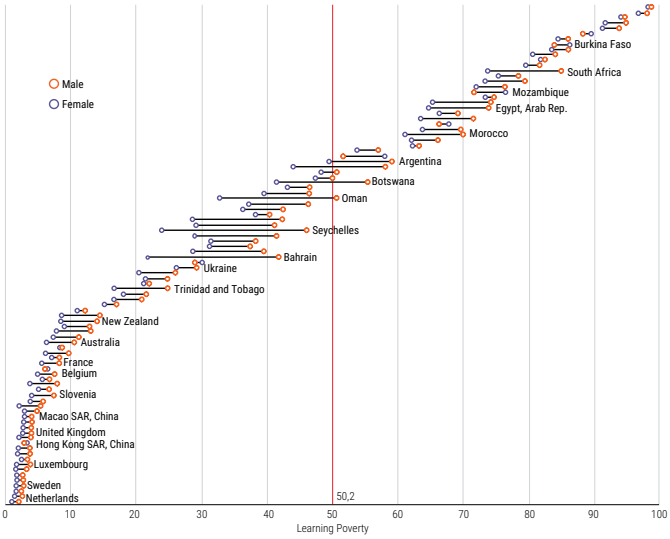
4) How Do Lighter Touch Structured Pedagogy Programs Ultimately Compare with Deeper Investments?

We have seen that some interventions funded by the World Bank and the Global Partnership for Education have had substantially smaller impacts on learning.[208] Per child, however, those interventions sometimes have a lower cost (though not always, given the wastefulness of some multilateral program interventions). A key assumption to the cost-effectiveness assessments of the GEEAP is that one needs to have an impact in order to have any cost-effectiveness.[209] What remains to be learned is what the minimum per child investment is that will result in long-term sustainable impacts on learning. We assume that it is possible to improve the quality of the multilateral and even government-only structured pedagogy interventions in LMICs, but more research is necessary to determine how best to ensure impacts of structured pedagogy while reducing cost per child. Our final comment on this point is that it is not worth doing any reform more cheaply if cost is the only determinant, because there is a long history of cheap but entirely ineffectual education reforms.

5) Do Structured Program Impacts Differ by Gender?

The World Bank's learning poverty report estimated whether countries' learning outcomes differed by gender.[210] For some countries in sub-Saharan Africa in particular, learning outcomes were typically higher for boys than girls, although there was variation in the gender and learning outcomes comparisons in the region. The learning poverty measures from World Bank (2019) showed small but meaningful higher learning poverty estimates for girls than boys, particularly for some countries in sub-Saharan Africa on the right part of the graph in Figure 13. Structured pedagogy programs can have substantial impacts on learning outcomes for girls. In fact, Evans and Yuan found that the structured pedagogy programs that were not specifically targeted at girls had a larger impact on girls' learning outcomes than programs that focused on helping girls in particular.[211] This result suggests that good instruction helps girls. We found consistently better outcomes for girls, particularly in lower primary literacy, in structured pedagogy programs designed for all students. The evidence is less clear as to whether the impacts of structured pedagogy programs differ by the gender of teachers, coaches, or government officers. Initial cross-sectional noncausal evidence seems to indicate that outcomes are somewhat better for students taught by a woman, but more research will be necessary to determine whether these differences are general for female teachers or specific to structured pedagogy programs.[212]

FIGURE 13. Learning outcomes by gender[209]



6) How Should Effective Literacy and Numeracy Programs Work Together?

There is significant evidence about the design and effectiveness of early grade literacy programs. The evidence for early grade numeracy programs is

developing, with some initial evidence of impact at scale.[213] Our knowledge of how literacy and numeracy structured pedagogy programs can interact most effectively is nascent. More evidence, particularly at large scale, is needed both on the design of numeracy programs and on the ways in which they complement literacy programs, and vice versa.[214] However, there are lessons learned from a few programs that have targeted literacy and numeracy at the same time. Some programs have effectively used storybooks with embedded numeracy concepts (FHI360 in Nigeria and Save the Children in Bangladesh), or promoted common instructional strategies such as "extending conversations in numeracy and literacy" in Kenya's Tayari program.[215] In general, a review of the evidence recommends that whereas literacy and numeracy are taught as two distinct subjects, given the different ways in which the content is organized and differences in instructional practices, efforts to make underlying linkages explicit to teachers are key to ensure a comprehensive approach.[216] For example, strong language skills are needed not just for oral comprehension, but also for communication and discussion of mathematical ideas. It is especially important given that many teachers in primary school teach both numeracy and literacy and that any cost-effective literacy and numeracy program integration would depend on training and supporting teachers in an integrated fashion (see Guide 6, on teacher support).

7) How much do effective structured pedagogy programs cost?

Although structured pedagogy interventions have expanded in many LMICs, knowledge remains limited as to how much these programs cost and whether there is a threshold of cost required to ensure effectiveness. The "Smart Buys" work characterized the effectiveness of structured pedagogy programs by their cost and showed that some of these programs were as cost-effective as any other program in the sector,[217] averaging more than three learning adjusted years per schooling per US$100 investment. Data collected during the PRIMR intervention provided details on costs and allowed for a cost-effectiveness analysis.[218] More evidence-gathering is under way in this area, and the Learning at Scale research will be able to describe the costs and cost-effectiveness of structured pedagogy interventions by early 2021. This is critical information to share with policy makers as they determine how scarce resources should best be invested.

E. Conclusion

This literature review has focused on what we know and what we do not know about structured pedagogy programs in low- and middle-income countries. The structured pedagogy how-to guides address particular tasks within the structured pedagogy framework that would help us understand how to implement particular tasks within the structured pedagogy framework. We encourage readers to review the other titles in this series to consider how to effectively implement large-scale foundational literacy and numeracy programs in low- and middle-income countries. The guides to structured pedagogy that accompany this literature review are:

GUIDE 1: Government Leadership and Teacher Adoption

Effective foundational literacy and numeracy programs need government leadership. This requires listening to government priorities, amplifying the ideas of champions, and using country-specific evidence. Succeeding in these programs requires understanding teacher decision-making and ensuring civil servants' job descriptions and incentives align with program priorities.

GUIDE 2: Designing an Effective Structured Pedagogy Program

Program impact depends on key program design decisions. More effective programs do more by doing less and simplifying the task of improving teacher pedagogy, and they have programs that are designed to be scaled up and use evidence of rigorous pilot studies to implement the most effective interventions.

GUIDE 3: Curriculum and Scope and Sequence Development for Literacy and Numeracy

Learn about the expected skills of students, what teachers do well, and expectations for a curriculum adjustment. Decide skills and pacing that aligns with the science though collaboration with the government. Develop a living scope and sequence.

GUIDE 4: Teaching and Learning Materials Development

Ensure that any student materials are engaging, simple, and appropriate to the target grade level. Teacher materials should be closely aligned with student materials, provide scaffolding appropriate to teacher experiences, and have everything needed for a lesson clearly laid out in one place. Do not underestimate the amount of time necessary to develop high quality materials.

GUIDE 5: Teacher Professional Development: Teacher training

Design training programs based on adult learning principles focusing on practical experiences with the content that is immediately relevant to build self-efficacy before teachers enter the classrooms. Plan logistics of larger trainings as far in advance as possible ensuring support to all levels of a training cascade.

GUIDE 6: Teacher Professional Development: Ongoing Teacher Support

Develop and implement a system to ensure that teachers receive ongoing support after they have participated in training. Include multiple touch-points for teachers and ensure that coaches and communities of practice receive enough training and support to help teachers succeed.

GUIDE 7: Data, Systems, and Accountability

Work with government to embed data systems that promote accessible, rapid feedback on each program component, taking limited resources and varying priorities into account. Communicate findings in a timely manner to ensure accountability, adaptation and a demand for further data and future use.

GUIDE 8: What Education Leaders Need to Know

Set and communicate student level outcomes in ways that all stakeholders can understand. Hold the system accountable for providing schools, teachers and students the supports they need to achieve those outcomes.

RESOURCES

Structured pedagogy program report commissioned by USAID: Available at www.edu-links.org.

Structured pedagogy report commissioned by UNICEF: Structured pedagogy: For real-time equitable improvements in learning outcomes, v. 02. See endnote 1. https://www.unicef.org/esa/documents/structured-pedagogy.

Evidence report on what works in Africa: https://www.cgdev.org/sites/default/files/education-africa-what-are-we-learning.pdf. See endnote 73.

World Bank learning poverty report: https://openknowledge.worldbank.org/handle/10986/32553. See endnote 6.

Brief on improving girls' learning: https://www.cgdev.org/sites/default/files/evans-yuan-girls-education-factsheet.pdf

Developing teacher's guides for structured pedagogy programs: https://doi.org/10.3768/rtipress.2018.op.0053.1805. See endnote 115.

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Structured Pedagogy

GUIDE 1

Government Leadership and Program Adoption

INTRODUCTION

No large-scale foundational literacy and numeracy (FLN) program can be effective without government leadership. Given that keystone, it is unfortunate how often donors, technical advisors, and implementers are ineffectual in creating the conditions necessary for governments to take the lead. This failure often eliminates the likelihood of meaningful sustainability of the intervention from the outset. Learning outcomes are difficult to change, as this requires tens of thousands of teachers to change their pedagogy, but when government leads and the majority of teachers adopt the program, impacts on learning are possible. This guide presents step-by-step processes to ensure that an interested government can provide leadership and increase program adoption.

In some cases, a government may internally fund and guide an FLN program, successfully embedding it within existing structures and systems. The education systems of Sobral, Brazil, and Puebla, Mexico, for example, made substantial impacts on learning while being led directly from government structures. These interventions connected the FLN program's goals to broader societal goals. In other cases, external funders may provide the initial impetus and financial support. In either instance, meaningful engagement and uptake will contribute significantly to the overall success of the program; obtaining it will take time but is essential.

Consider undertaking an institutional mapping process before any of the steps in this brief. Mapping the ministry of education will tell you about:

1. **its formal hierarchy** and how its staff make decisions;
2. **its informal hierarchy**—that is, which individuals wield power, their relationships to the decision makers, and their associated social connections; and
3. **any interinstitutional relationships**. Of particular interest are the ministry's key policy focus and its relationships with the ministry of finance, civil service, parastatals (including curriculum bodies, teacher management organizations and assessment structures), teachers' unions, teacher professional associations, and civil society.

Even if no one conducted a mapping exercise at the beginning of a literacy or numeracy program or while it was being designed, mapping can still prove helpful mid-implementation.

GOVERNMENT LEADERSHIP STEP 1

START BY LISTENING

What are the priorities of the technical education leaders in a country? Successful FLN programs will respond to those priorities and demands. It's easy to get the official approval letter. What differentiates successful and unsuccessful FLN programs is whether the program is seen as and is actually responsive to the demands of key leaders. Whether a program is led by a team inside the government or it evolves as a partnership with a technical assistance team outside of government, a key task is understanding who the meaningful decision makers are and what are their priorities.

As noted above, undertaking a political mapping of the ministry and associated government organs—including the ministry of finance, teachers' unions, and the body representing supervising teachers—

will reveal who the influencers are. Just as crucially in some contexts, it will expose who the blockers are. **The organizers must listen, carefully, to understand what government leaders want, who makes the decisions within the government structure, and where the power poles are within the various ministry of education organs**. From a slightly different perspective, an FLN program's success depends on understanding whether and how these key leaders' short-term and career goals align with the program's objectives.

As a case in point, when a program is guided by listening, it will be easier to avoid confrontations over semantics or controversial terminology. For example, many programs funded by a larger bilateral donor have focused on *reading*, whereas the curriculum bodies they were supporting preferred the term *literacy* to include writing as well. **Simply adapting terminology to the countries' preferred own usage could sidestep a certain amount of confusion or resentment**.

GOVERNMENT LEADERSHIP STEP 2

DEVELOP DEMAND BY RESPONDING TO LOCAL PRIORITIES

An effective FLN program not only should respond to the priorities of key actors in the system, but also will:

- **Align with the incentives of individual teachers**. How are they evaluated and what mechanisms influence their career trajectories?
- **Integrate the priorities of structured pedagogy into what the government already wants to happen and when**. In particular, too many externally sourced FLN programs implement without regard for the government's planning rhythms.
- **Understand the core budget cycle and make key asks at the appropriate moment**. This awareness will make budgetary requests as well as planning and personnel allocations more likely.
- **Watch for and exploit policy windows**. The education sector planning process provides multiple opportunities to take advantage of. The development of the education sector plan that occur every several years and the joint sector reviews that typically happen yearly are ideal policy windows. Other opportunities, such as a promise made by a politician, citizens' demands for better learning outcomes, or changes in how government officers are supervised.

Not all effective techniques for stimulating demand for structured pedagogy are technocratic, however. They often depend on soft skills, patiently and persistently navigating complex government bureaucracies and persuading them that improving FLN is a win–win for everyone. Effective FLN programs have been able to work with government partners to have them increase instructional time, institute consistent teacher communities of practice meetings as part of the week, and even budget for, purchase and distribute student books using government funds and systems. Working with the government is possible when the program aligns to their priorities and systems. In short, it is easier to swim with the current.

GOVERNMENT LEADERSHIP STEP 3

HIRE KNOWLEDGEABLE AND RESPECTED STAFF

Because of the massive changes a system will need to undergo to implement an embedded and large-scale program, hiring and selecting appropriate staff for the task is essential. This truth applies whether the program is overseen by an external technical implementer or whether the government has its own project implementation unit.

These staff will need to achieve the role of respected advisors to the technical decision makers. In the case of external programs, they should be selected without robbing the ministry of education and associated organs of their staff; respected retired ministry officers may serve this role well. Ideally, the hiring decisions should stem from the political mapping discussed above: Who in the government makes decisions, and how might these team members connect? Former classmates and colleagues of ministry officials, if they have the required expertise, talents and skills, often make outstanding advisors. Successful staff members should certainly include technical experts in literacy and numeracy who make meaningful contributions to how these learning improvement changes can be made.

HIRING AND SELECTING APPROPRIATE STAFF FOR THE TASK IS ESSENTIAL

Trusted staff and advisors can assume responsibility for organizing "pre-meetings" with key ministry decision makers. At these sessions, they can describe how the FLN activity is in

the interest of this specific government officer. The staff also can expend their social capital to differentiate the proposed FLN intervention from previous programs that the government counterpart may have seen come and go. They can advocate for counterparts to decide this program is real and to invest their own capital in its success.

GOVERNMENT LEADERSHIP STEP 4

AMPLIFY CHAMPIONS' IDEAS

Effective structured pedagogy programs have champions. Champions are not necessarily those Ministry staff initially most open to the idea, but instead those with influence and a desire for change.

A structured pedagogy FLN program—which many will see as primarily about teacher lesson plans and student textbooks—will be effective only if a vast number of integrated activities happen substantially differently than they typically do. That said, it would be arrogant to assume that an FLN program based on the best evidence internationally will work everywhere. The task is to be informed by the best evidence internationally, but to ensure that this is a country specific program responding to the solutions available locally. Undoubtedly, important ideas for accomplishing this goal and improving outcomes are already circulating within a given system. **The job of the FLN leader is to get access to the room where those ideas are being discussed at the national level, to amplify those ideas within the FLN program, and to give credit to the leaders—the champions—from whom those ideas came**.

Think about how your team and program can help in ways beyond the specific FLN task at hand to build trust at the ministry. Consider using your team's expertise to help the ministry with other tasks in different sub-sectors to show your value.

GOVERNMENT LEADERSHIP STEP 5

BUILD WITH EVIDENCE

Evidence makes a difference. The opportunity to present this structured pedagogy program to the minister for the first time may be a big deal for you (whether you work in the government or are an external partner), but you may be the third of 10 different groups with new ideas she is going to hear today. There are two problems with this picture: (1) You should not be going to present a program, but to listen to ideas and ambitions; and (2) you will likely be equipped with evidence on the state of learning outcomes that are less than desirable, but also on solutions that are locally suggested to overcome the key impediments to better teaching. What proof can you offer to differentiate your structured pedagogy program from the many others in the past that had little impact on learning?

The evidence currency may be substantially different within governments than for funders or researchers. Our experience suggests that evidence from education-related randomized controlled trials can help with persuasion. But published papers seldom have the greatest effect. Instead, the best arguments are graphs that show impact, combined with interviews with teachers who have implemented, observations in effective classrooms, and field trips to see the program in operation. Effective programs do not need to script their site visits, because government leaders can tell the difference between a performance and a program that actually works. Having leaders visit schools and read or do basic math with a student in a typical school can exert a substantial impact on decision-making. A senior, and quite skeptical, Kenyan Ministry of Education leader, was consistently unconvinced by flashy figures and graphs showing the impact of the PRIMR pilot intervention results. It was during a visit to a set of rural schools, where he ignored the formalities of the visit and spent time reading with children one on one, he became convinced of the ability of PRIMR to be scaled up.

GOVERNMENT LEADERS CAN TELL THE DIFFERENCE BETWEEN A SHOW VISIT WITH LITTLE SUBSTANCE AND A PROGRAM THAT ACTUALLY WORKS

Ongoing check-ins with teams implementing across the country are a means to maintain a conversation on how to improve, allowing the team to learn and adapt to results. And even a well-designed program can benefit from seeking jointly funded, small-scale research to respond to the issues that key government leaders raise. These small investments can pay huge dividends in terms of both program quality and government leadership.

GOVERNMENT LEADERSHIP STEP 6

FIND THE POWER CENTERS

Understanding power centers is important for pairing hopes for change with political will. Every national government has more than one decision-making center, particularly among countries that have decentralized their key functions. Local Education Groups include donors, civil society and education implementers and are important actors to understand, both their role and their influence on decision-making.

The institutional mapping process can clarify who has influence over what portions of the FLN intervention, who within that body has decision-making power, and what the sensitivities are between that group and others in the sector. With this knowledge, the intervention team can better avoid becoming ensnared in uncomfortable disagreements between rival services of the government.

Decentralized structures typically have varying levels of influence over instructional improvements. Targeting the right investments to each level, therefore, is essential. For example, because of the financial implications and prestige, training staff from all parts of the Ministry often is raised as a high priority, even if the program design foresees a small return on such an investment in terms of the desired outcomes due to training officers who are only tangentially connected to structured pedagogy implementation. To ensure cost-effectiveness, therefore, an FLN program will need to navigate differences of opinion between power centers carefully. These choices can introduce trade-offs, though; it is possible that one group within the government will become hostile to the intervention if they perceive that they are being slighted through lack of involvement.

Countries differ in the layers of midlevel civil servants that exist between the minister and the teacher. **Regardless of the number of layers, program adoption efforts must address not only the top level, but also the middle layers and the realities of their daily professional activities and incentives**.

PROGRAM ADOPTION STEP 1

JOB DESCRIPTIONS AND INCENTIVES

How are teachers, coaches, supervisors, and civil servants in the education sector evaluated, and what are they tasked with doing? Knowing this information will indicate how best to motivate them, and also will allow the structured pedagogy program's theory of change to be aligned to individual and group incentives.

Job descriptions, surprisingly enough, may be among the most important differentiators between structured pedagogy programs that work and those that do not. **It is essential for effective structured pedagogy programs to review job descriptions, evaluation criteria, and organizational charts, and to work with government partners to align all those documents**. Some of the more effective structured pedagogy programs have committed to working with the government to change job descriptions and evaluation criteria. This effort may be as simple as affirming that existing requirements in a job description align with a program objective and that these objectives can be included in annual reviews. Or it may require modifying job descriptions to emphasize instructional support, for example, and discussing how time allocated to new responsibilities will affect compensation.

Job descriptions' close companion is individual performance evaluation. When government administrators are evaluated on the basis of structured pedagogy interventions being implemented effectively, then the data produced by an structured pedagogy program (see Guide 7 in this series, on data, systems, and accountability) become valuable currency, incentives change, and meaningful impacts become possible. If these changes take hold throughout the system, the administrators may begin coming to the structured pedagogy program for evidence on how things are going and taking it upon themselves to ensure that their officers implement effectively.

The ultimate goal is to have these officers operate as principal change agents who lead the debate over how decentralized funding is spent, so that the budgeted resources align with daily instructional implementation—including classroom observations, feedback to teachers, and community-of-practice meetings, depending on the design of the structured pedagogy program. It will not happen in each context in the same way, but it is possible to move from an investigation of job descriptions to meaningful leadership at the national and subnational levels emphasizing better teaching and more learning. Some programs, for example, have worked with the government to change the amount of instructional time allotted for literacy and numeracy lessons, to incorporate teacher learning and reflection meetings into weekly tasks, and to ensure that teaching the structured pedagogy lessons becomes an evaluation criterion.

JOB DESCRIPTIONS MAY BE AMONG THE MOST IMPORTANT DIFFERENTIATORS BETWEEN STRUCTURED PEDAGOGY PROGRAMS THAT WORK AND THOSE THAT DO NOT

PROGRAM ADOPTION STEP 2

UNDERSTAND TEACHERS

Teachers themselves have much to contribute to the programming conversation. **FLN programs will struggle if they have not held discussions with teachers—including those in rural areas—to understand what their jobs are like, what the current barriers to improved pedagogical methods are**, or how they have responded to previous large-scale programs. Moreover, many programs have made the mistake of not considering how teachers and civil servants advance, what relationship teachers have with civil society, what structures surround teachers, and who has influence over their daily pedagogical behavior. The teachers the program should seek to reach out to should include a wide swathe of the teacher population, in terms of gender, seniority, ethnicity and location. In addition, it is critical to understand the role of teachers' unions in contributing to the status of the teaching profession and the mechanism for teacher change.

Evidence from other contexts can be a helpful starting point, but successful FLN programs will also incorporate deep local knowledge of the political economy of education in a given country. It means studying how teachers' jobs can be changed to align with other desired improvements, such as more teaching time and better use of new materials.

PROGRAM ADOPTION STEP 3

PEDAGOGICAL DECISION-MAKING

Fundamentally, the task of improving foundational literacy and numeracy hinges on raising the quality of teaching and supporting the instructional decision-making of individual teachers—tens of thousands of them, across the country. If a large percentage of those teachers teach the program competently, they will deliver program impact.

What messages will national and subnational leaders promote among their teachers about the relative importance of this program vis-à-vis other competing priorities? It is helpful to have the national and ministerial leadership, and local education leader speaking with one voice about the importance of implementing the FLN intervention. Even more consequential, however, is the experience of individual teachers. No matter what top-down messages are shared, teachers in many countries have a substantial amount of agency and decision-making power in their pedagogical decisions. **Program leaders should thoughtfully measure the level of difficulty of the FLN program for the teacher against what the teachers are used to doing. A program that teachers consider too complex will have little to no chance of being implemented consistently.**

To explain further, we offer the "swing teacher" model illustrated in Figure 1. Swing voters are the voters who do not affiliate with a particular party and can be persuaded in one direction or another. In that way, they are like teachers who can be persuaded to implement the program. Suppose some portion of teachers (the **GREEN** block) is highly motivated and willing to try new interventions even if they are complicated. Another portion of teachers (the **RED** block) will not implement the intervention no matter how teacher-friendly and effective it is. These teachers might be near the end of their career and have seen many new approaches come and go, or other factors may undermine their motivation to try new approaches, such as overloading or low pay. Illogically, FLN programs often spend too much time and resources on these two portions of the teacher population, despite the fact that no matter what the program does, there will be little impact on them, either positively or negatively.

On the other hand, a substantial number of "swing teachers" represent the middle population (the **YELLOW** block). They are not against the program, so to speak, and would implement it if conditions improved. Examples of favorable conditions would be:

- The program is simple.
- It reduces the amount of time it takes teachers to prepare lessons.
- Teachers can identify impact on learning within a few weeks.
- Teachers have the skills to implement the program.
- Supervisors reinforce the need to implement.

Focusing on swing teachers, like swing voters, would encourage designers to simplify their program and to reduce extraneous activities. It would prevail against having a complex set of teaching booklets, training manuals, continuous assessment booklets, and lesson plans (see Guide 4, on materials). The

IT IS HELPFUL TO HAVE THE PRESIDENT, MINISTER, AND LOCAL EDUCATION LEADER SPEAKING WITH ONE VOICE ABOUT THE IMPORTANCE OF IMPLEMENTING THE FLN INTERVENTION

Funda Wande program in South Africa simplified their program, allowing them to target the teachers in the yellow, swing teacher category, rather than the green category of teachers willing to implement complex programs.

An analogy with technology adoption in education may be instructive. Early adopters will become comfortable with the new technologies quickly and use them at a high level. Targeting a large-scale, digitally focused program at their level of interest, however, would result in solutions too complicated to be implemented by the typical teacher in the system, who is less accustomed to complex gadgets. Therefore, consider simplifying the intervention to better target the "swing teacher" and maximize the likelihood that they see the program as both effective and doable.

FIGURE 1: THE "SWING" TEACHER MODEL

CONCLUSION

Recognizing how much government leaders can influence FLN programs, and putting that influence to good use, can make programs have substantially larger impacts. On the other hand, it is easy to say that the government leads the FLN program and that teachers have adopted it. Far more difficult—but also more rewarding—is to actually walk through the process of developing government leadership in ways that will improve impact and last beyond the official lifespan of the program. This is the ideal way to ensure true sustainability, because programs that start with government leadership and integration into government processes are far more likely to not only be effective, but to last.

About the symbols in this guide:

Indicates "Red Alert": Something to be aware of and alert to, because it is a common problem

Indicates "Non-negotiable": a must-have

RESOURCES

Indian Prime Minister Narendra Modi announces an increased focus on foundational literacy and numeracy https://www.youtube.com/watch?v=Y9JA7VK0e8o&feature=youtu.be&ab_channel=CentralSquareFoundation

Kenyan President Uhuru Kenyatta at the launch of the Tusome national literacy program (in Kiswahili) https://www.youtube.com/watch?v=3zh3xI2orB4&ab_channel=TeamUhuru

Opinion piece by Piper on the proper role of international donors and technical experts on implementing education programs https://doi.org/10.1007/s11159-016-9544-y

Institutional mapping tool to better understand the actors in the system, starting on page 60. https://www.urc-chs.com/sites/default/files/urc-grn-lla.pdf

Simple political mapping tool for understanding Ministry structures, on page 21 and 22. https://pdf.usaid.gov/pdf_docs/PNACA721.pdf

Important guide to understanding teachers and the social dialogue needed to consider teacher change. https://dakar.iiep.unesco.org/sites/default/files/fields/publication_files/methodological_guide_for_the_analysis_of_teacher_issues_-_2010.pdf

Complete Series of Structured Pedagogy How-To Guides: https://scienceofteaching.s3.eu-west-3.amazonaws.com/index.html

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Guide authored by **Dr. Benjamin Piper**

Structured Pedagogy

GUIDE 2

Designing an Effective Structured Pedagogy Program

INTRODUCTION

The effectiveness of structured pedagogy programs depends on key program design decisions. Even the best implementation cannot overcome poor program design. This guide suggests several key steps for designing programs effectively, designing for large-scale implementation within government systems, and organizing programs to respond to various options.

ESSENTIAL PROGRAM DESIGN CONSIDERATIONS

Do More by Doing Less

A key metric that determines how effective a structured pedagogy program will be is the proportion of teachers implementing the program daily. Many programs struggle for two reasons. First, the program does not sufficiently incorporate what is known about how to implement foundational literacy and numeracy (FLN) programs effectively. (See Guide 3 and Guide 4), and second, the teachers that the program targets do not teach the program consistently or at all. The program is not fundamentally ineffective, but teachers resist it.

This lack of adherence is likely if a program is not designed to change the instructional decision-making of typical teachers, in the given context. **In other words, a program will never have a chance if it asks teachers—the key clientele—to learn and carry out too many new instructional practices, or if the teachers perceive the new methods to be too complicated or too much additional work**. Consider ways to design a program that teachers find actually simplifies their lives such as a teachers' guide with daily lessons and instructions so teachers can focus on the instruction and not spend too much time reorganizing content.

In short, remember that students' average performance gains will depend primarily on the percentage of schools and teachers that implement the FLN program consistently, and program design can have a substantial impact on this ratio. While simplifying program design is essential, this must not ignore the needs of children from vulnerable populations or those with special needs.

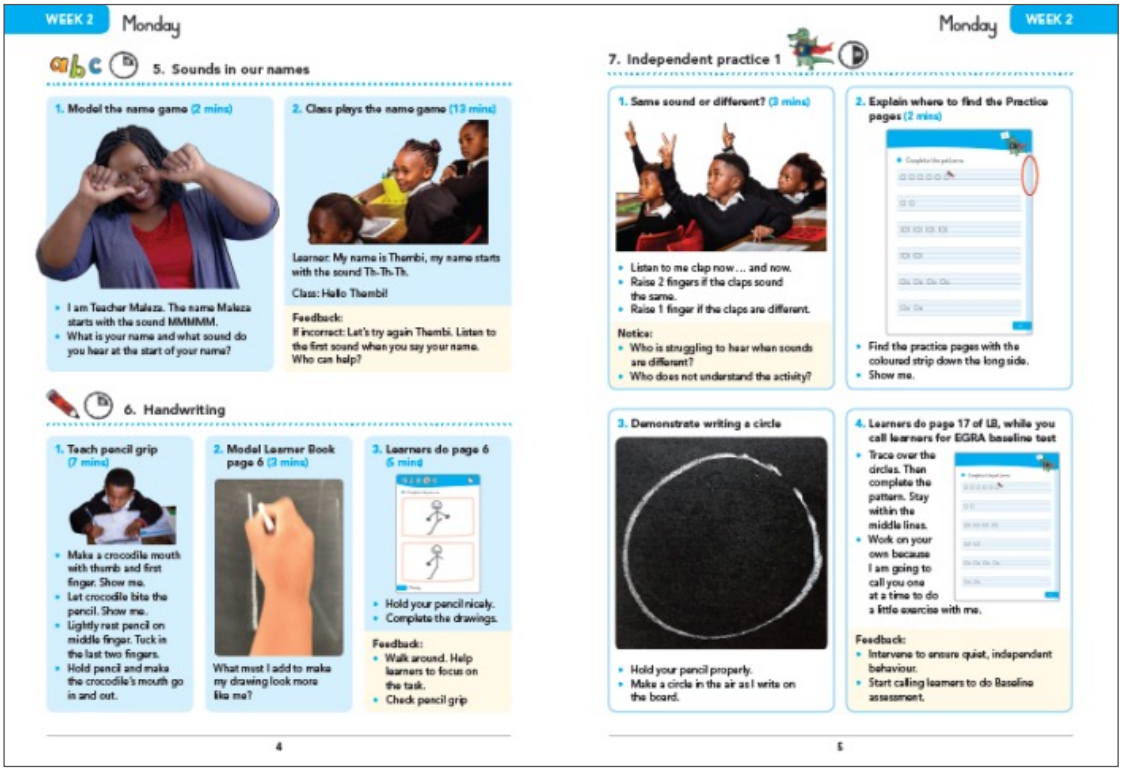
Focus on the Teacher-Change Process

Pay attention to the threshold for what teachers are likely to take up during the short period that they are in training, and to attempt once they are alone back in their classroom. Limit the instructional approach to require as little new information as possible. Some literacy programs have made the mistake of starting their training and implementation with too much: a teacher's guide, an assessment manual, teacher read-alouds, a core textbook, supplementary readers, and writing journals. These materials are not useless in and of themselves, but having too many new program elements make it more likely that teachers perceive the program to be too complicated.

The Funda Wande program revised their instructional materials in 2020 to reduce their instructional content to simplify the work for teachers. Figure 2 shows the revised integrated teachers' guides. They are attractive, integrate many elements that were previously separated, and make the task of following the lesson routine easy for teachers. Programs like Funda Wande show what is possible when the teacher-change process is considered and materials are simplified to help teachers implement more easily.

What does this mean, in practice? Many teachers will not use carefully designed but overly complex program materials daily. If they do not teach every day, the program will not work. In other words, the complexity of the intervention ultimately will reduce its effectiveness. Instead, determine what materials can be combined or let go, and simplify the new instructional activities expected of teachers.

FIGURE 1. Sample of Funda Wande revised integrated teacher's guides



Source: Funda Wande, 2020.

Design a Program That Uses Multiple Touch Points

Learning is not generally an isolated experience for children. Teachers of young students, on the other hand, often do their work with no other adults present. When designing implementation, consider the frequency and consistency with which teachers can realistically learn and be supported through trainings, coaching, and communities of practice. The more often teachers have an opportunity to be in touch with, learn from, and ask questions of trainers, coaches, and other teachers, the more likely they are to feel confident and supported (see Guide 6 on ongoing teacher support).

We recommend more frequent but shorter touchpoints rather than fewer, longer and more costly trainings. These multiple touch points can also incorporate accountability checks and reviews of what challenges teachers are having, so the program can pivot or adapt as needed.

Respond to Policy Opportunities

Effective structured pedagogy programs find strategic opportunities to fit within the policy environment. These windows are chances to align the intervention to individual educators' incentives and the overall direction of the system (see Guide 1 on government leadership and program adoption). Key opportunities include curriculum reforms or the development of new teacher evaluation standards.

A structured pedagogy intervention can link to these massive system changes, using the new structures to steer behaviors toward improved implementation. On the other hand, revising an existing program while a new curriculum is coming online leads to a complicated process of

Possible policy opportunities include:

- Curriculum reform
- Revised standards for evaluating teachers
- Revised timetable
- New school year calendar
- Language-of-instruction policies
- Development of sector plan
- Joint sector review

determining how much of the program to keep and what will need to be changed. It is essential for the program to fit into the curriculum, but many curricula do allow opportunities for reorganization and resequencing (see Guide 3 on curriculum and scope & sequence).

Other opportunities in the policy environment might include changes in instructional time, reallocations of subject times or topics, new school calendars, or revised language-of-instruction policies. **It is likely, if not inevitable, that a structured pedagogy program implemented over several years will face a major policy change within its lifespan, so design into the program a process to rapidly realign with high-level changes.** It is also likely, if not inevitable, that the intervention will face a policy change that contravenes improving instruction at large scale. Retain policy experts who can help to advocate for decisions that will maximize the likelihood that the intervention's core components can withstand the change.

DESIGN FOR SCALE

Listen to Government Leaders

The first step in designing an effective large-scale structured pedagogy intervention is to listen to government leaders' priorities and incentives. We present recommendations in Guide 1 on government leadership and teacher adoption.

Pilot for Scale-Up

The second step is to structure a pilot intervention in a way that it can be scaled up. To emphasize this point: Design the pilot for scale. If the pilot or the small-scale activities that precede the scale-up are substantially different from what will happen during implementation across the country, the intervention will fail.

If your intervention will operate within government systems, use the pilot to test your assumptions of how government officers will actually function. For example, **if your intervention addresses language of instruction, test it in contexts where the teachers do not necessarily speak the language fluently and coaches may have no skills in the language at all—particularly if that is the reality of implementation in significant parts of the country**. Introducing a language-of-instruction intervention only in contexts in which the policy environment is already perfectly attuned to it will reduce the pilot's ability to inform implementation in contexts with language mismatches.

Design for Iterations

Expect to be wrong: Avoid the hubris of assuming you will figure it out the first time. Effective structured pedagogy programs anticipate a desperate need to iterate and revise, **so plan for and build in the time and opportunity to reflect and adapt. Be prepared, for example, to improve the design of textbooks, the structure and pace of teacher training, and the mechanisms for teacher support**:

- **Student and teacher textbooks.** As knowledge increases regarding what works, revise textbooks with respect to the physical layout, the depth and complexity of the guidance to teachers, the instructional time actually available and used, and the correlations between the student textbooks and teachers' guides (refer to Guide 5 on teacher professional development). Conduct user testing and respond iteratively to adapt to what teachers prefer and use most effectively.
- **Teacher training**. Modify training to balance time for content absorption with enough practice for teachers to internalize new techniques with confidence. Writing out the entire training program at once will prove too inflexible, though we know that having time for modeling and practice is essential. Instead, design a plan for the trainings but expect to respond to classroom feedback to determine what teachers need to practice and what skills they need to develop at the next training.
- **Teacher support**. Adapt your program design over time in response to which instructional supervisors prove most capable of cost-effectively providing ongoing support. At the beginning, you might not know whether the best resource consists of head teachers, inspectors, quality assurance officers, or coaches (if that position exists). Moreover, the initial means for incentivizing coaching visits might change. Investigate the variety of instructional support methods

EXPECT TO BE WRONG: AVOID THE HUBRIS OF ASSUME YOU WILL FIGURE IT OUT CORRECTLY THE FIRST TIME.

that programs have used (see Guide 6 on teacher support); test and determine which ones work best in your context.

In short, initial missteps and oversights in program design are inevitable. Build into your design the time and opportunities for ongoing comparisons to determine how to fix the initial problems.

MAXIMIZE THE AVAILABLE TIME

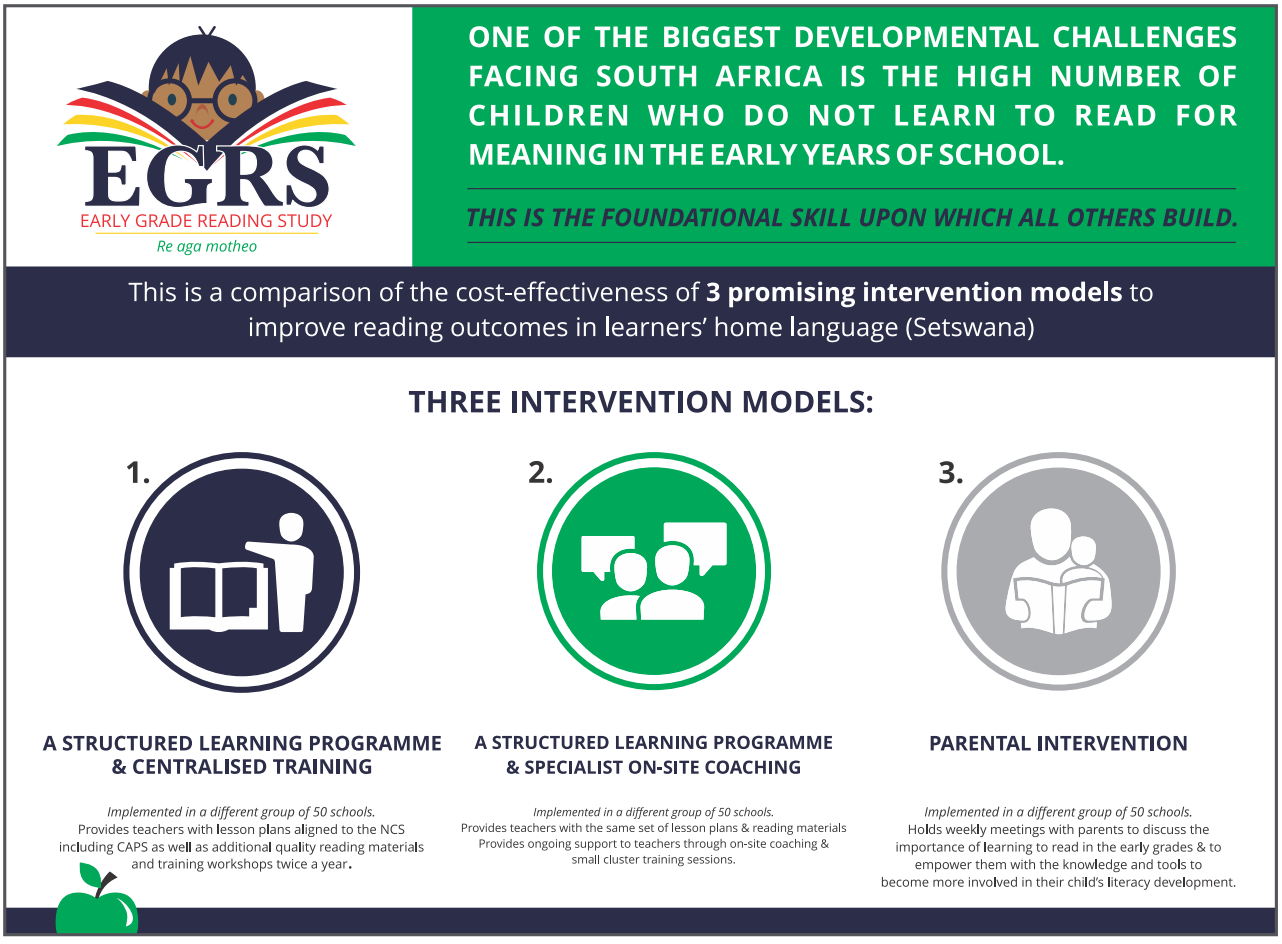
This section presents pilot options tied to how much time is available before large-scale implementation at the beginning of the first academic year. Ideally, one would have 18 months prior to full scale implementation to develop materials and pilot prior to implementation. But how should you respond if preparation time is more limited? Consider the options below for completing several specific activities before program rollout begins. No matter how much time you have, we think that it is essential to be ready to implement with books and materials delivered to schools and teachers trained prior to the beginning of the academic year. Missing the beginning of the academic year can severely reduce program impact over the lifespan of the intervention. Plan for large scale book printing and distribution to take a minimum of six months with training happening concurrently. The sections below describe pilot and testing possibilities depending on how much additional time is available prior to the first academic year.

NO MATTER HOW MUCH TIME YOU HAVE, BE READY TO IMPLEMENT WITH BOOKS AND MATERIALS IN SCHOOLS AND TEACHERS TRAINED AT THE BEGINNING OF THE ACADEMIC YEAR

Pilot with More Than a Year

In addition to planning for the materials distribution and teacher training, design a rapid randomized controlled trial responding to particular research questions of interest to the government and relevant to successful program implementation. This research might resemble the South Africa Department of Education's Early Grade Reading Study, which tested several different policy options, as shown in Figure 2. Use a full year of small-scale pilot implementation to test the key aspects of the program, including materials

FIGURE 2. South Africa Early Grade Reading Study: Real-world policy comparisons



Source: Department of Basic Education, Republic of South Africa, 2017.

design, training modalities, and post-training support. The Kenya PRIMR program used an ingredients method to test whether new training programs, revised student books at a 1:1 ratio, or teachers' guides had the largest impact on learning. The study allowed an analysis of which combination of ingredients were most effective. Including these types of research studies allow for a better designed scaled up program.[7] Other pilot study designs could examine the impact of community based interventions or other key design possibilities.

Pilot with 6 Months to a Year

This time frame will allow for a short pilot implementation period. If the teaching and learning materials are not fully completed at the beginning, use a short-term pilot to test the portion of the materials that is finished. For example, the teachers could implement using one term's worth of completed materials while you finalize the rest of the program content. The focus of this pilot would be on short-term outcomes and teacher implementation. This phased approach would allow a basic analysis of teachers' impressions of the materials, training, and support structures and would produce insights into the pace of student progress in the short term.

Pilot with 3 to 6 Months

This amount of time is not sufficient to solve many of the problems likely inherent in large-scale structured pedagogy implementation, but there are some practical options. First, teachers' views of how the teacher's guides and student textbooks work will inform their use of the materials. Thus, include user testing of various layouts as a formal part of your process. Take several weeks to observe teachers using the materials to determine how they function in classrooms. Note, however, that you will not be able to correlate these user-testing programs with changes in student outcomes, though anecdotal evidence for particular instructional approaches might exist. You will also not be able to observe high quality lessons in this short period of time, as teachers will still be learning the new instructional approach.

Spend time with education officers who could provide coaching within the system, such as head teachers, instructional coaches, or inspectors. Examine these officers' job descriptions. Do they incorporate instructional support and support for communities of learning? (See Guide 6 on ongoing teacher support) Just because these personnel exist in the system does not mean that improvements can be built around them, so test this supposition before the program rolls out fully and with heavy dependence on a particular cadre. Note that before scale-up, the Early Grade Reading Study in South Africa (see Figure 2) pilot tested a program that incorporated specialist, on-site coaches.

CONCLUSION

If the structured program has not yet invested in careful design, piloting and revision, it is suggested that you stop all activities and do these steps immediately. The program will benefit tremendously from time spent learning how to do it well; in fact, these considerations often differentiate a mediocre program from a highly effective one. In summary, we recommend the following steps:

1. **Simplify**. Review your program design and find ways to limit the load on the teachers. In other words, reduce the instructional complexity.
2. **Use existing structures**. To prepare for scale-up, design the program to use existing government structures.
3. **Assess policies**. Build on the existing policy environment and make practical choices to create opportunities for useful piloting. Two example pilot programs to study are the Early Grade Reading Study in South Africa and the Primary Math and Reading Initiative (PRIMR) in Kenya.
4. **Learn and adapt**. Embed opportunities to iterate and revise over the lifespan of the program.

About the symbols in this guide:

Indicates "Red Alert": Something to be aware of and alert to, because it is a common problem

Indicates "Non-negotiable": a must-have

RESOURCES

Key Kenyan Ministry of Education leaders discuss the Tusome literacy program. https://www.youtube.com/watch?v=7ddTK-qDroo&t=10s.

Dr. Stephen Taylor Director-Research Coordination discusses the policy relevance of the Early Grade Reading Study in South Africa, designed to answer questions about how to most effective improve literacy. https://www.education.gov.za/Portals/0/Documents/Publications/EGRS/Stephen%20Taylor%20540p.mp4.

The Uganda LARA program shares the 5 Ts of reading in the Ugandan context. https://youtu.be/DOM9w99Jm_U.

Mary Ann Bates and Rachel Glennerster consider the complexities of understanding what principles from research generalize from one context to another https://ssir.org/articles/entry/the_generalizability_puzzle

This article discusses how to design programs to be effective at scale, written by Gove, Korda Poole and Piper. https://doi.org/10.1002/cad.20195.

Using large scale research from India, Muralidharan and Niehaus discuss the power of using medium to large scale studies to understand how programs work at scale. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3057188.

Karthik Muralidharan discusses the necessity of evaluating programs at scale in Andhra Pradesh India. https://www.youtube.com/watch?v=RTdQ-Pfrt10&ab_channel=J-PAL.

Complete Series of Structured Pedagogy How-To Guides: https://scienceofteaching.s3.eu-west-3.amazonaws.com/index.html

TECHNICAL EXPERTISE NEEDED

Expert in research and structural pedagogy design: to advise on possible piloting options and contribute to designing structured pedagogy pilot research.

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Structured Pedagogy

GUIDE 3

Curriculum and Scope and Sequence Development for Literacy and Numeracy

INTRODUCTION

This guide discusses the steps involved in examining the existing national curriculum and developing a scope and sequence. This fundamental process occurs before anyone writes literacy and numeracy materials, so that the content is contextualized, reflects country-level standards, and is developmentally appropriate.

National curricula vary across countries. Some provide lists of skills that children should be able to do by the end of the school year. Others include high-level concepts that show objectives organized by grade spans. Some curricula include activities, or ways children demonstrate proficiency; and still others contain when to teach and for how long, often referred to as pacing guidelines or curricular frameworks. In some contexts, the term "curriculum" includes the set of textbooks, teacher guides, and supplementary materials. The definition of curriculum includes:

WHAT: The skills children are expected to know at the end of each school year

WHEN: Guidance on pacing and how to distribute the skills throughout the school year

HOW: Textbooks, supplemental materials, teacher's guides, suggested instructional activities, and information on how instruction should look

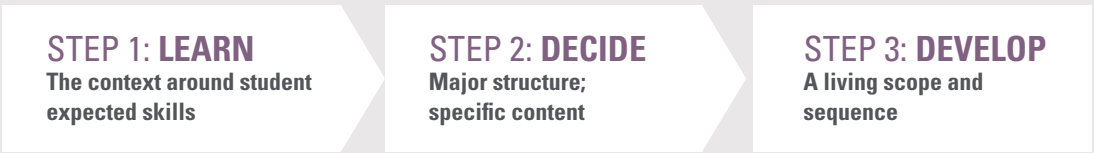
(Note: Curricula vary by countries, so not all will have the what, when, and how that we describe, and some countries may have information not included in the definition.)

The first section—Step 1—covers learning about the existing curriculum, which has to happen before structured pedagogy program decisions (Step 2) are made with government officials. These two steps, in turn, must precede development of a scope and sequence (Step 3).

Scope refers to the breadth and depth of content knowledge and skills to be covered. **Sequence** refers to how content knowledge and skills are ordered and presented over time. Thus, a **scope and sequence** is a document that lists the skills that children learn each day and week. It is based on the curriculum and steers the writing of a textbook and teacher's guide. This "map" for developing textbooks and teacher's guides helps ensure that the produced materials address the intended skills and are consistent.

Figure 1 presents the three key steps for collaboration with government.

FIGURE 1. Three collaboration steps



STEP 1. LEARN THE CONTEXT

What is the context affecting the curriculum that students are expected to learn? Answers to this essential question may come from the curriculum department, from curriculum documents detailing the expected student skills, and from teachers. Learning the context (i.e. Step 1) is criticial for success, so plan for it.

Learn from the Curriculum Department

For sustainability, and in the interest of a positive partnership, collaborate where the curriculum is conceived and developed. Meet with the curriculum department at the Ministry of Education or other relevant entity to learn their priorities and goals and how the curriculum was developed. Listen to their perceptions of the existing curriculum and what they identify as its strengths and weaknesses. Learn their process of materials development and where they are in the curriculum review cycle. Learn their interest in interim adjustments to address learning outcomes. Invite members of their team to collaborate in a review of the expected student skills and any inputs contributed by teachers (See below).

Learn from Curriculum Documents What Student Skills Are Expected

Have literacy or numeracy experts examine the existing curricula by grade and assess whether and when the skills needed for student growth are included. These documents may include standards, pacing frameworks, textbooks, teacher's guides, and supplemental materials. Core elements that are desired include:

For literacy–

1. Presence of print knowledge, phonological awareness, alphabetics, fluency, vocabulary, comprehension, and writing (See Background to Literacy Concepts on page 6)
2. Developmental progressions, with content becoming systematically more difficult at a reasonable pace (See Figure 2)
3. Varied text interactions (teacher read-alouds, decodable text[1], stories, informational narratives, poetry)
4. Linkages among oral language, reading, and writing content
5. Use of a familiar language to children and approaches to support those who are learning in an additional language

FIGURE 2. Reading fluency progression in the early grades

For numeracy–

1. Inclusion of all domains in foundational mathematics (numbers, operations, algebra, measurement, geometry, spatial awareness, and statistics and data analysis)
2. Clear developmental progressions within and across all domains (See Figure 3)
3. Focus on both conceptual understanding and procedural skills (e.g., intial emphasis on the meaning of addition will lead to automaticity of basic facts)
4. Progression from concrete to pictorial to abstract within domains (See Figure 4)

FIGURE 3. Developmental progressions for numeracy

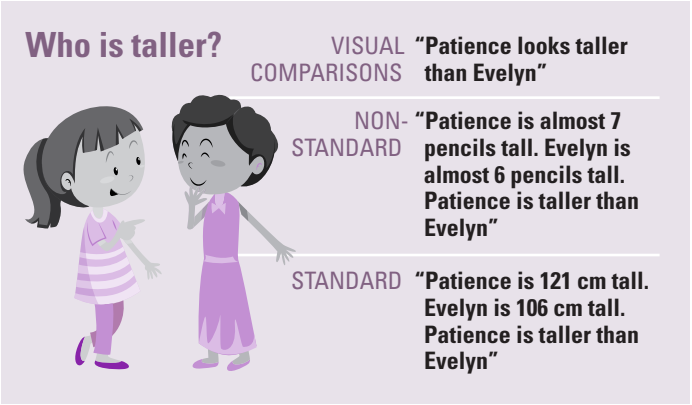
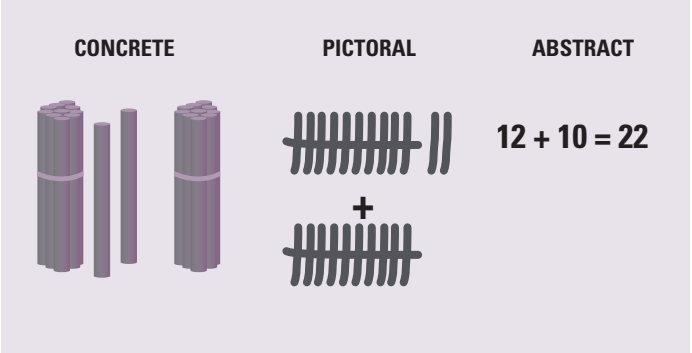


FIGURE 4. Stages of progression for numeracy



1. Books and passages with a concentration of words using spelling patterns that students have been taught to read. They help to improve reading accuracy.

Learn from Teachers

Teachers will have been using the existing curriculum, including any accompanying materials, so learning from them will be informative. Seek out their voices and know what they are doing, so that any suggested changes will be more credible and effective.

Observe the Teachers

Learn what teachers do well, what they do frequently, and what is missing. Prepare to use their existing pedagogy as a bridge to new methods that will be included in the new materials. Building from their existing methods will increase uptake of the new structured pedagogy and it will be cultural responsive. For example, teachers might regularly start the class by singing or by counting the number of children. Exercises like these help to develop oral language and number sense, respectively. Yet these practices could be adjusted slightly to improve outcomes. For example, showing a print version of the song would help children develop a concept of word within a text. And instead of only counting, new concepts such as addition could be introduced (e.g., How many girls? Boys? How many altogether?).

Examine how skills are taught in the various grades across both literacy and numeracy. Measure the time devoted to each skill and how lessons are organized (e.g., handwriting is needed but it should not dominate the time allocated to writing). Understand the instructional practices (e.g., discussion, repetition, independent practice) and grouping (e.g., whole class, small group, individual) used. Learn the extent to which universal design principles are applied to make content accessible for all students. Watch for adjustments to instruction via informal assessment.

In literacy observations, learn:

- The explicitness of decoding strategies (e.g., A teacher says, "These two letters, s h [pointing to the two letters], work together to make one sound /sh/)
- Teacher's use of a child-friendly language for explanations
- Skills applied in reading and writing

In numeracy observations, learn:

- The use of teacher and student explanations of how a problem was solved
- How mathematical models are used
- The strength of the link between formal and informal mathematics

After the observations, interview teachers as experts. Listen to them describe the parts of the curriculum or textbook they like and use confidently. Ask them to identify where they want more support. For example, some teachers may express interest in a method that they learned in teacher college but have never used since (see Textbox 1). Ask questions to understand the culture of the classroom, such as how they characterize successful students. Encourage specificity, referring to the lesson just observed. Learn how teachers plan lessons and the extent they follow the curriculum and requirements. For example, some teachers may reduce the allotted time for a subject because they want to devote more time to a skill their students need. In other words, aim to learn whether they adjust for skills or content that might be lacking in the curriculum and whether lesson planning is meaningful or a burden.

TEXTBOX 1

SAMPLE INPUT FROM TEACHERS: PHONICS

Prior to creating an intervention with structured pedagogy, teachers who would use the new materials were interviewed and they expressed appreciation for phonics with comments such as, "The moment they acquire skills on sounds, their problem is solved." Yet, despite this appreciation, many teachers did not include phonics because, "Phonics is not in the books that I use." (Dubeck, Jukes, and Okello, "Early Primary Literacy," 2012, 56–57)

STEP 2. DECIDE

Following the pedological review in the learning step, prepare to make a series of informed decisions about the skills to include and their pacing throughout a school year. The decisions will involve both major structural issues and specific content.

Structural Decisions

Engaging the Ministry of Education (or other relevant body) is necessary for making informed structural decisions. First, consider the approaches suggested in Guide 1 on government leadership and teacher adoption, regarding the need to listen more than speaking. Begin by asking questions and hearing the official's perspectives. Only after that, share what was learned in Step 1 from the skill review, the teacher observations, and interviews. Introduce global standards (e.g., the Global Proficiency Framework), or regional ones, noting descriptors by grade. Then provide an orientation to literacy or numeracy methodologies and ways to achieve some of the standards through curriculum adjustments. Decide together whether new materials will be created. If yes, continue to define the parameters.

Multiple structural decisions will guide the rest of the scope and sequence process:

1. First, decide the **grade levels** to address. If multiple grades, decide whether the new materials will be introduced concurrently or in succession.
2. Determine whether the **languages** will be the existing ones or new ones, and used as the language of instruction for all subjects or taught as bilingual program. The use of an international language, a regional lingual franca, a local language, or multiple languages all have benefits and challenges that the new materials will amplify. (See forthcoming guide dedicated to language for a full discussion.)
3. Next, prioritize the **proficiencies** that the new materials will address (e.g., by the end of grade 1 children will know the sounds associated with letters of the alphabet; by the end of grade 2, children will be able to add and subtract numbers up to 20). Then establish the minutes per day and week for literacy or numeracy instruction. Ask the Ministry if any additional time in the instructional calendar could be devoted to literacy or numeracy.
4. Finally, agree on the **materials** that will be developed. Advise that starting simple (e.g., student textbook and teacher's guide) is the best way to engage teachers. Supplemental materials can follow. Choose the level of guidance offered in the materials, suggesting that scaffolded daily lessons with steps on how to do an activity are the ideal support for teachers using new pedagogies.

Content Decisions

With the major decisions about the structure settled, it is time to make content decisions. First, assemble a small team (e.g., 5–7 people per subject and grade) who will develop the scope and sequence. Members can be drawn from the curriculum department; academia; early grade teachers; and technicians with literacy, numeracy, curriculum, assessment, or language expertise. Ensure that the team is appropriately sized for making decisions efficiently.

The team's first task is to establish guiding principles that will set the tone, help to maintain the instructional objectives, and serve the material writers (see Textbox 2). Base the guiding principles on research, reflect other successful literacy/numeracy models, and add any missing skills that were noted during Step 1, learn the context. For each learning objective, a literacy or numeracy technical expert

TEXTBOX 2: Guiding principles

For literacy:

- Determine which skills will be taught and their frequency each week.
- Establish parameters to ensure consistency and appropriate increases of difficulty (e.g., quantity of new letters, decodable words, sight words, and vocabulary per week; and word, sentence, and story length).
- Agree on sources for content. Existing standards with themes or topics can be referenced (copyright permitting) or new content can be created.
- Identify desired pedagogical activities to be further refined by the writers.

For numeracy:

- Group any aligned skills together (e.g., number recognition and object counting).
- Develop pacing across and within domains, ensuring that concepts are revisited with depth (e.g., geometry is integrated throughout the year instead of blocked into one month).
- Develop mini-developmental progressions for objectives (e.g., the steps that lead to proficiency in addition and subtraction to 20 by the end of the year).
- Develop an activity bank using textbooks, teacher's guides, and resources from similar contexts. Choose manipulatives or resources that are easily obtainable so as not to overburden teachers. See Resources.

should compile and be familiar with pertinent research specific to each for use in developing the scope and sequence (e.g., familiarity with the developmental progression for measurement of length). The substantial research science must guide all recommendations.

STEP 3. DEVELOP A LIVING SCOPE AND SEQUENCE

Learning the context (Step 1) and making the structural and content decisions (Step 2) provide a solid foundation for developing the scope and sequence (Step 3). We call the scope and sequence a "living" document because as writers begin to develop the instructional materials (see Guide 4, on materials), they will point out adjustments that need to be made to it.

Building the scope and sequence can begin as soon as the guiding principles are established. Between the guiding principles and the actual scope and sequence, expect to spend 6–8 days creating per grade level. The scope and sequence for multiple grade levels and languages can be created simultaneously, provided that there are enough qualified people, and that communication between teams is sufficiently close so that the content aligns and builds upon each other.

Logistics and Resources

Have one person create a file (ideally an Excel workbook) that presents the content decided in Step 2. One spreadsheet should list the skills, objectives, and themes (if used) and be organized by day, week, and term for the school year. Another spreadsheet will list the guiding principles, for easy reference. Institute protocols for version control, file naming, and updating to avoid duplication or loss of work.

In the meantime, gather sources for content. Word-level content used for phonics or vocabulary may come from the national curriculum, previously used instructional materials, or reference books. A reading technician or linguist should provide linguistic information such as the alphabet, letter frequencies, lists of orthographic patterns, and syllable structures. For numeracy, gather relevant content sources, such as the national curriculum and textbooks.

Plotting of Content

Next, reassemble the same team that developed the guiding principles. Have them refer regularly to the principles to help maintain the original goals. They will populate the cells with content for the first week of the term but also look ahead to the last week of the term. Establish internal checks to verify that new content is not introduced abruptly or too slowly. Plan periodic reviews by quality assurance teams composed of literacy and numeracy experts or government officials.

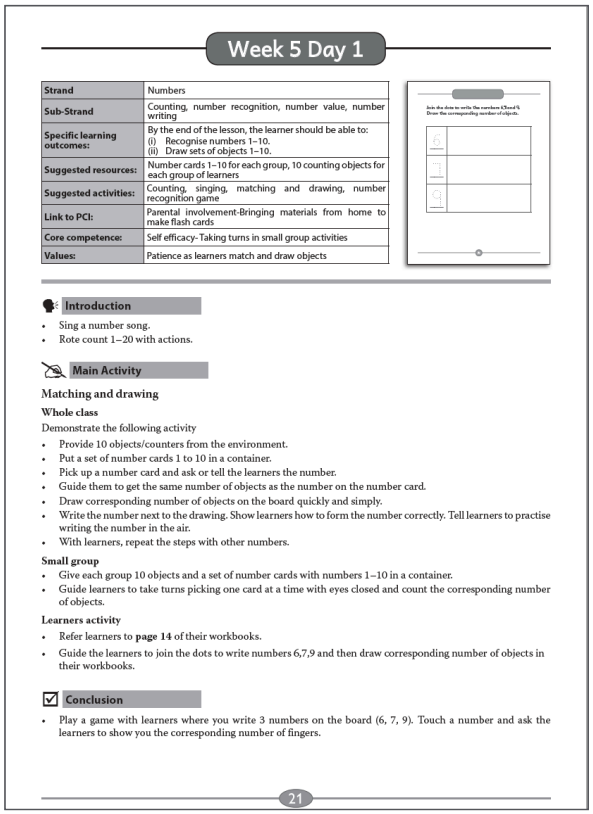
Updating

Once the scope and sequence has been populated with some content, share it with the writers. They will, in turn, create and share more in-depth content (such as a story they write or a math activity they create) to be placed into the scope and sequence. To illustrate, Figure 5 is an example of a scope and sequence paired with the relevant page of the teacher's guide.

As hectic as the writing process can be, we recommend that the scope and sequence be maintained and updated to serve as an accessible repository of all skills and content that are in the instructional materials.

FIGURE 5. One week of a scope and sequence and Day 1 from the numeracy teacher's guide (Tayari, 2017)

DAY	Week 5				
	Day 1	Day2	Day3	Day 4	Day 5
NUMBERS					
2.2.1 Counting	Rote counting 1-20, count objects 1-10	Rote counting 1-20, count objects 1-10	Rote counting 1-20, story/song/poem	Rote counting 1-20	Rote counting 1-20, story/song/poem
2.2.2 Number Recognition	Number recognition 1-10	Number recognition 1-10			
2.2.3 Number Sequence					
2.2.4 Number Value	Matching objects with numerals 1-10 draw sets of objects 1-10	Matching objects with numerals 1-10 (using a ten frame) draw sets of objects 1-10(using a			
2.2.5 Number Writing	Write 1-10	Write 1-10	Write 1-10		



Week 5 Day 1

Strand	Numbers
Sub-Strand	Counting, number recognition, number value, number writing
Specific learning outcomes:	By the end of the lesson, the learner should be able to: (i) Recognise numbers 1–10. (ii) Draw sets of objects 1–10.
Suggested resources:	Number cards 1–10 for each group, 10 counting objects for each group of learners
Suggested activities:	Counting, singing, matching and drawing, number recognition game
Link to PCI:	Parental involvement-Bringing materials from home to make flash cards
Core competence:	Self efficacy- Taking turns in small group activities
Values:	Patience as learners match and draw objects

Introduction

- Sing a number song.
- Rote count 1–20 with actions.

Main Activity

Matching and drawing

Whole class

Demonstrate the following activity

- Provide 10 objects/counters from the environment.
- Put a set of number cards 1 to 10 in a container.
- Pick up a number card and ask or tell the learners the number.
- Guide them to get the same number of objects as the number on the number card.
- Draw corresponding number of objects on the board quickly and simply.
- Write the number next to the drawing. Show learners how to form the number correctly. Tell learners to practise writing the number in the air.
- With learners, repeat the steps with other numbers.

Small group

- Give each group 10 objects and a set of number cards with numbers 1–10 in a container.
- Guide learners to take turns picking one card at a time with eyes closed and count the corresponding number of objects.

Learners activity

- Refer learners to **page 14** of their workbooks.
- Guide the learners to join the dots to write numbers 6,7,9 and then draw corresponding number of objects in their workbooks.

Conclusion

- Play a game with learners where you write 3 numbers on the board (6, 7, 9). Touch a number and ask the learners to show you the corresponding number of fingers.

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TEXTBOX 3: Background to Literacy Concepts

Print knowledge is learning that sounds can be represented by symbols, it is meaningful, and has different purposes. Developing it includes:

book orientation, directionality, space between words, purpose for reading, discussing title, purpose of punctuation, examining text structure

Phonological awareness is sensitivity to the sound structure of a language. It includes awareness of words in sentences, syllables, and individual sounds (i.e., phonemes). Learning to recognize the salient phonological unit for a langauge helps to learn to read words in it. Developing it includes:

sentence segmentation, syllable blending, onset-rime, phoneme identification, phoneme blending/segmenting, rhyme, alliteration

Alphabetics is the evolution of knowledge of how letters (or symbols) and their patterns represent the sounds of a language. It is needed to read and spell words. It is best taught through systematic and explicit phonics instruction. Developing it varies by language but generally includes:

sound/symbol (letter) correspondence, blending and segmenting syllables, blending words by sounds, by syllable and morphological unit

Fluency is ultimately the ability to read with accuracy, at a rate that demonstrates understanding and with expression. Developing it includes:

finger pointing, making a speech to print match, attention to word reading accuracy, attention to improved reading rate, matching voice to the meaning of the text

Vocabulary, in general, is word knowledge. It supports understanding of text and writing ones' own text. Developing it includes:

word exploration, use in speaking and writing, classification and categorization of words

Comprehension is the process of simultaneously extracting and constructing meaning of written text. All of the concepts listed in this table contribute to it. Developing it includes:

wide reading, vocabulary development, examining text structure, strategies

Writing has a reciprocal relationship to reading. Opportunities to write must begin from the onset of formal education. Developing it includes:

spelling, handwriting, writing for meaning, writing to mimic

RESOURCES

Global Proficiency Framework containing minimum proficiency levels in reading and mathematics for grades 1-9:

- Reading: http://tcg.uis.unesco.org/wp-content/uploads/sites/4/2020/10/WG-GAML-4-reading-4.1.1-Global-proficiency-framework.pdf
- Math: http://tcg.uis.unesco.org/wp-content/uploads/sites/4/2020/10/WG-GAML-4-mathematics-4.1.1-Global-proficiency-framework.pdf

Technical reference document for numeracy, which explains key curricular and instructional focus areas: https://shared.rti.org/content/instructional-strategies-mathematics-early-grades.

Website for learning about learning trajectories in numeracy: https://www.learningtrajectories.org/

Tool for evaluating curriculum from a science of reading perspective: https://www.thereadingleague.org/wp-content/uploads/2020/08/Curriculum-Evaluation-Tool-August-2020.pdf

Blog on Creative Commons and Licensing and publishing quality in Africa and Asia: https://www.globalreadingnetwork.net/learning/creative-common-and-open-source-licensing-resources-affect-publishing-quality-africa-and

Complete Series of Structured Pedagogy How-To Guides: https://scienceofteaching.s3.eu-west-3.amazonaws.com/index.html

TECHNICAL EXPERTISE NEEDED

Linguist or language expert(s): (one for each language): will play a key role from curriculum analysis through scope and sequence development process, as skill progression and development are highly language dependent.

Reading pedagogy: expert familiar with structured pedagogy reading curriculum and instructional practices, who can play a guiding role during curriculum analysis and scope and sequence development.

Math pedagogy: expert familiar with structured pedagogy numeracy curriculum and instructional practices, who can play a guiding role during curriculum analysis and scope and sequence development.

REFERENCES

1 Dubeck, Margaret M., Matthew C. H. Jukes, and George Okello. "Early Primary Literacy Instruction in Kenya." Comparative Education Review 56, no. 1 (2012): 48 –68. https://doi.org/10.1086/660693.

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Structured Pedagogy

GUIDE 4

Teaching and Learning Materials Development

INTRODUCTION

Teaching and learning materials, including a teacher's guide and textbooks, are a core pillar of a structured pedagogy program. These materials must be designed to support skills in line with the curriculum and scope and sequence, discussed in detail in Guide 3 of this Structured Pedagogy series. Here, we discuss decisions that must be made and steps to take when developing TLMs. While not discussed in detail in this brief, piloting of materials before large-scale rollout is essential, as is planning for revision of materials based on teacher feedback and challenges found during rollout. It is also important to note that this development process, starting with the scope and sequence and ending with print-ready copies, typically takes 6–12 months. Trying to accelerate inevitably results in lower quality materials and risks delays in getting the books to students.

DECISIONS/CONSIDERATIONS REGARDING MATERIALS

Before beginning materials development, decide what types of materials to develop. For example, do you want the students to be able to write in their books or not? For reading, do you want separate decodable books, or should all reading texts be included in the textbooks? What kinds of math manipulatives (objects for children to use in math class, such as counters) and teaching aids should be used, and will you provide them or expect teachers to make them? Most of these decisions will be driven by budget limitations, local preferences, and teachers' capacity. In all cases, the purpose that the materials serve for instruction must be kept in mind, which might be summarized as shown in Table 1. Due to the limited scope and space, this guide will focus on textbooks and teachers' guides as the minimum necessary materials, though it is important to consider other essential learning materials that would support learning.

TABLE 1. Learning materials' purpose

Literacy	Numeracy
Reading instructional materials should give a chance for: • the teacher to ***model (I do)*** skills and students to follow as the teacher is modeling. • •the students to ***practice with guidance (We do)***, either as a whole class or in groups; and • •the students to ***practice independently (You do)***, individually and/or in small groups.	Mathematics instructional materials should give a chance for: • the students to **attempt to make sense of a new problem" to "solve a new problem"**, usually at the start of a lesson, individually and/or in small groups; • the teacher and students to jointly ***discuss problem solving strategies***; • the students to ***practice solving additional problems independently***, individually and/or in small groups; and • the students to have ***hands-on practice with manipulatives*** when new concepts are introduced.
All subjects should: • provide opportunities for routine checks for understanding, and • incorporate opportunities for remedial practice (for struggling students) and/or enhancement (for more advanced students).	

Preparing for Content Development

Map out a unit or week of lessons—Before embarking on writing content of the textbook and teacher's guide, you need to look at the scope and sequence and any other agreements made during the scope and sequence process and decide what a unit of lessons will look like. This includes the number of lessons in a unit and what skills will be taught on which days, as well as possible types of activities and time for each activity. Generally, it is ideal for units to follow a predictable pattern. For example: *The Tusome reading program has 5 lessons per week. Days 1 and 3 are new content. Days 2 and 4 review and extend content from the previous day, and Day 5 is used for review of all content and assessment.*[1] Figure 1 shows this pattern in the time table for units in Grade 1 English. Predictability makes it easy for teachers and students to know what is coming next and to focus on learning the skill rather than learning new instructions. Consider how skills, activities, and time spent on different skill areas need to change as the year progresses, in keeping with the scope and sequence. When working on multiple grades, ensure this is done for each grade, taking into account what is being included in the previous grade. In essence, the idea is to start writing out what the weeks and daily lessons will look like as a whole, given the skills being developed according to the scope and sequence.

FIGURE 1. Tusome Grade 1 English Timetable (minutes)

Reading and Writing Lessons (36 to 150)

Unit Lessons					
Activity	Introduction 1	Practice 1	Introduction 2	Practice 2	Unit Review
Phonological Awareness	3	3	3	3	3
Letter Knowledge	3	2	3	2	4
Word Reading	4	3	4	3	5
Vocabulary & Common Words	5	4	5	4	5
Grammar	5		5		5
Pupil Text Reading	5	5	5	5	
Teacher Read Aloud		4		4	
Comprehension Questions	5	5	5	5	
Writing Classwork		4		4	8
Total Time	30	30	30	30	30

Criteria for content—Once there is a good idea of what the units will look like, and referring to the scope and sequence, the core content will begin to fall into place. In order to prepare for the lessons and units to then be developed into book content, provide criteria or guidance for the writing team. For example, for reading, it will not be enough to simply ask writers to write a text about a theme or to choose three words for a particular activity. Writers will need guidance on how to decide which words to use. Should the words in a particular lesson be 3 letters? Or 4? How many words should the text have in each lesson, and how will that increase across the year? For math, the writers will need similar cues on how to develop problems for activities for each lesson. For example, for 2-digit addition problems at what point do we include problems with regrouping versus no regrouping? **In addition, math writers should take into consideration the number of manipulatives needed for each activity so we do not over burden teachers**. Writers will need to know that content, especially texts, should be relevant and adapted to lived experiences of children. Math content should make connections to real life situations. Content should also be relevant to any themes included in the curriculum. Much of this information will appear in the scope and sequence, but it will be important to have this information clearly stated for writers either in the scope and sequence or writing templates—and if adjustments must be made as the content is being laid out, they should be similarly adjusted in the scope and sequence document.

DEVELOPING THE TEXTBOOK

The student book and teachers' guide should be planned together, but the student book may be written first so that the teachers' guide will be aligned to and correctly reference student book pages. It is important to bring the writers together to develop the textbook, rather than have them work individually at home. A writing team ideally will include people with complementary skills, including subject expertise and writing experience. See the table below for an example of a materials development team.

When organizing the teams, it is helpful to plan to have one or two of the team members assigned as reviewers (perhaps the curriculum expert and a teacher). They can then review lessons as they are being created, since revision on some of the initial lessons may impact how future lessons are written (see Table 2).

When planning for the writers' workshop there are two main aspects to address: the documents and tools that will be needed and the facilitation of the workshop itself.

Documents and Tools

- Templates for the writing team that clearly lay out what to write for each unit and lesson, including the criteria

TABLE 2. Material Development Personnel

Participants	Expertise	Role
Instructional subject matter expert	Expert not only in the subject but also in how to teach and develop curriculum for the subject and grade level	• Support design of instructional approach and present it to the group • Support the writers and reviewers as necessary • Guide development of teacher's guide scaffolding/ scripting
Production manager	Expertise in book production maybe a staff or publisher	• Support with managing the process • Help make production-related decisions
Reviewers	Staff, consultants or ministry of education, who have good understanding of the instructional approach and how to develop content	• Review writer's work against the scope and sequence and writing criteria • Support in development of teacher's guide scaffolding/ scripting
Writers	Staff, teachers, ministry of education, local authors who have some experience developing curriculum or content	• Write the content • Teachers support in development of teacher's' guide scaffolding/scripting
Graphic designer	Expertise in layout development especially of textbooks and InDesign	• Design layouts for books
Administrative support	Expertise in organization and administrative tasks	• Provide administrative support

- Handouts of key documents, such as the scope and sequence, any previous books that the team might need to reference, and a computer for each group to use for writing
- A brief on the purpose of the workshop and the criteria for writing content. Depending on the writers' experience, you may also need to present concepts about the development of skills for the subject and grade level as well as guidance on how to write certain kinds of content, such as fictional stories or informational texts.

Writers' Workshop Facilitation

- The workshop will likely begin with presentations explaining the instructional approach, making any final decisions about layout or team formation, and possibly targeted training on how to develop certain content, such as story-writing. This should be led by an expert in instruction for the subject and grade level, perhaps a staff member or consultant experienced in curriculum and instructional design.
- Allow the writing team(s) to work on one lesson at first, then have a reviewer give feedback before the group moves on. Once certain the group understands the task well, allow them to work on a full unit before reviewing their work. The work should be planned so all content is developed by the end of the workshop as much as possible. If you have less time, bring on more writers—though consider the balance of quality work and speed when bringing on less-experienced writers.

Content Review and Revision

Once the first draft of the content has been developed, there will likely be a need to review the content and make revisions. Use a smaller group to review and make revisions. The reviewers from the writers' workshop may be best placed to handle this.

Also, at this stage, include at least one or two people from the ministry who will be approving the book for use in classrooms. Having their eye on the content as it is being finalized can help avoid any surprises and likely will speed up the approval process.

During this process, a checklist or review tool will help focus the work. Reviewers will want to check:

- Does content match the scope and sequence?
- Does content match the agreements or principles that were decided upon?
- Does content match the criteria that were used for content development?
- Is the language appropriate for the grade level? (difficulty of words, sentence structure, etc.)
- Are texts engaging and appropriate for the grade level (no violence or inappropriate subject matter)?
- Are there typos or grammatical errors?

DEVELOPING THE TEACHER'S GUIDE

Teacher's Guide Decisions/Considerations

There are a number of decisions to make about teacher's guide design and formatting, before the guide is developed. Recently RTI carried out a cross-country study of teacher's guides used in large-scale structured pedagogy reading programs that produced a number of useful findings to help guide these decisions.[2] The following are based on findings from this study.

Instructional approach and activities. In order to decide what instructional activities will be suggested for lessons, a clear approach to instruction will be needed. The time available for each lesson and available resources will help narrow down the choices. In many contexts a direct instruction[3] approach can be useful for reading in particular, as it utilizes explicit and systematic planning for each lesson, which helps make clear what teachers and students are supposed to focus on. Associated with this approach is the gradual release model,[4] One common gradual release approach is "I Do, We Do, You Do":

1) I do (teacher models),
2) We do (teacher and students practice together), and
3) You do (students practice without the teacher).

This model can be very useful for learning discrete skills such as letter sounds or word reading. For higher level skills in reading, such as some comprehension strategies like main idea, this approach may not fit as well.

Similarly, for numeracy, conceptual understanding and less discrete skills are not supported as well using the I do, We do, You do approach. For numeracy, ensure instruction allows time for students to solve problems and share solutions guided by teachers, and for students to work independently.[5] For example, the teacher might guide students to understand simple addition by having them explore a problem using counters first, then discussing what they found and building a model for solving simple addition problems together, See Guide 3 on scope and sequence for more detail.

Once you are settled on a core instructional approach, collect example activities that fit the approach for each skill set that will be taught. Creating something like an activity bank can help, especially when involving ministry or other stakeholders who may be new to the approach. This step will require significant support from an instructional expert in literacy or numeracy for the targeted grade levels of the program.

Level of scaffolding for the teacher. Consider the capacity of teachers and how the instructional approach will align with context. Based on those considerations, you can decide how much scaffolding for teachers will be included. This pertains to both the degree to which full, daily lessons plans are presented in the guide, and the degree to which the guide is "scripted," that is, whether teachers are given explicit instructions for every activity, including what to say to students, or they will receive less explicit, or even minimal, instructions.

This may be the biggest and most complicated decision to make. It is also an important reason to pilot the materials before full implementation. **The RTI teacher's guide study found that teachers appreciated a high level of scaffolding or scripting, but did not necessarily need it for the whole teacher's guide. The final guidance from this RTI study is to begin in the first weeks with more heavily scaffolded lessons and taper off as the year goes on**. This will help in two ways. First, teachers will gain more independence over time. Second, the length of the teacher's guide will be reduced. Think of scripting as an example to teachers of the kind of teacher talk that is explicit and leads to student understanding. Once teachers understand this way of talking with students, it is no longer necessary to repeat it.

Teachers' prior knowledge and experience. It would be good to include scaffolding that would help teachers anticipate possible student responses and provide tips for feedback. For example, A guide could give teachers tips on how to remediate common errors in arithmetic—useful if students solve 35+29 as 54 instead of 64, for example.

Organizing the lesson guidance. Another insight gained from the teacher's guide study was that guides that included everything necessary for a lesson in one place were used more effectively. Having to search in multiple places in a book for activity instructions, content, and teaching aids will mean teachers might miss something in their lesson preparation. For this reason, make sure the teachers' guide includes references to all materials, including any essential learning materials, objectives and simple assessments for each lesson. **Also, designing the guide so that an image of the textbook page can fit on the same page was well appreciated by teachers, as they then did not have to go back and forth between books while teaching**.

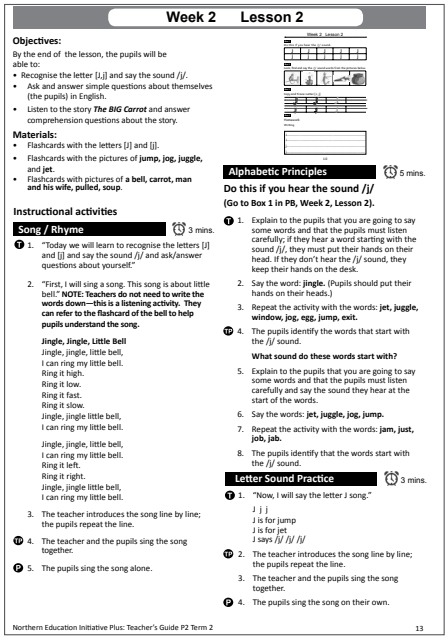
Length of each lesson. Instructions for each lesson should be on one page, or on two facing pages, though this may vary depending on the length of classes. **When making this decision, keep in mind**

that teachers are more likely to carry and use a guide that is shorter. Make a few mock-ups and see what seems realistic. Also pilot with teachers to understand what they prefer (Guide 2 Designing an effective structured pedagogy program). This will also force you to think hard about the most essential things to include.

Use bolding, italics, underlining systematically. **Using formatting and font styles in a systematic way can help save a lot of space, but has to be CONSISTENT on every page**. For example, you can bold the content (target words, syllables, numbers, or problems) in each lesson or you can put in italics anything that teachers are supposed to say to students. Whatever decision is made about the format must be purposeful and used the same way in every single activity on every page or teachers will be confused.

Writing the Teacher's Guide

The teacher's guide can be developed in tandem with the textbook, or subsequently. In either case, the lesson



Week 2 Lesson 2

Objectives:

By the end of the lesson, the pupils will be able to:

- Recognise the letter [J,j] and say the sound /j/.
- Ask and answer simple questions about themselves (the pupils) in English.
- Listen to the story ***The BIG Carrot*** and answer comprehension questions about the story.

Materials:

- Flashcards with the letters [J] and [j].
- Flashcards with the pictures of **jump, jog, juggle,** and **jet**.
- Flashcards with pictures of **a bell, carrot, man and his wife, pulled, soup**.

Instructional activities

Song / Rhyme 3 mins.

T 1. "Today we will learn to recognise the letters [J] and [j] and say the sound /j/ and ask/answer questions about yourself."

2. "First, I will sing a song. This song is about little bell." **NOTE: Teachers do not need to write the words down—this is a listening activity. They can refer to the flashcard of the bell to help pupils understand the song.**

Jingle, Jingle, Little Bell
Jingle, jingle, little bell,
I can ring my little bell.
Ring it high.
Ring it low.
Ring it fast.
Ring it slow.
Jingle, jingle little bell,
I can ring my little bell.

Jingle, jingle, little bell,
I can ring my little bell.
Ring it left.
Ring it right.
Jingle, jingle little bell,
I can ring my little bell.

3. The teacher introduces the song line by line; the pupils repeat the line.

TP 4. The teacher and the pupils sing the song together.

P 5. The pupils sing the song alone.

Alphabetic Principles 5 mins.

Do this if you hear the sound /j/ (Go to Box 1 in PB, Week 2, Lesson 2).

T 1. Explain to the pupils that you are going to say some words and that the pupils must listen carefully; if they hear a word starting with the sound /j/, they must put their hands on their head. If they don't hear the /j/ sound, they keep their hands on the desk.

2. Say the word: **jingle.** (Pupils should put their hands on their heads.)

3. Repeat the activity with the words: **jet, juggle, window, jog, egg, jump, exit.**

TP 4. The pupils identify the words that start with the /j/ sound.

What sound do these words start with?

5. Explain to the pupils that you are going to say some words and that the pupils must listen carefully and say the sound they hear at the start of the words.

6. Say the words: **jet, juggle, jog, jump.**

7. Repeat the activity with the words: **jam, just, job, jab.**

8. The pupils identify that the words start with the /j/ sound.

Letter Sound Practice 3 mins.

T 1. "Now, I will say the letter J song."

J j j
J is for jump
J is for jet
J says /j/ /j/ /j/

TP 2. The teacher introduces the song line by line; the pupils repeat the line.

3. The teacher and the pupils sing the song together.

P 4. The pupils sing the song on their own.

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structures, core activities, and content will be linked to the scope and sequence and should have been laid out when preparing for textbook development. **The guide should be either written by individuals well experienced with the instructional approaches of the structured pedagogy program, or closely guided by an instructional expert for the subject and grade level**.

Develop scaffolding/scripts. The longest work of the guide development will come in developing the text for the activities in the lessons. The text should include the steps or instructions for each activity as well as any explanations of concepts that might be necessary such as grammar concepts or defining mathematical vocabulary. The scripts or instructions should be concise and very clear with no extraneous language. Have writers imagine they are talking to a classroom and need to explain in as few words as possible the skill or concept. We have found it effective to use a smaller group of writers with more expertise from staff and ministries of education, but also essential is involving teachers either in writing or reviewing to ensure the language is clear and useful to teachers. This process will require an expert in instruction for the subject and grade. It should be the same one that supported the scope and sequence and textbook content development, if possible.

Assuming the guide will begin with a high-level of scaffolding, such as full scripting, and taper to less scaffolding, such as no or very little scripting, make sure that both long and short scripts are developed ahead of time for all activities. It can help to keep track of them in a large table or spreadsheet.

Book Production Considerations

Developing the content is only part of the book development process. Both the textbook and teacher's guide must be designed and the content put into a format that can be printed. This process is not insignificant and should be included in the planning of the books. The following are the major considerations and steps to take.

THE LONGEST WORK OF THE GUIDE DEVELOPMENT WILL COME IN DEVELOPING THE TEXT FOR THE ACTIVITIES IN THE LESSONS

- **DECIDE WHO WILL PRODUCE THE BOOK**: Decide whether the program will handle all of the production elements in house or a publisher can be hired to support this process. A publisher will have all the expertise necessary in one place; however, it will require a bit more time to go back and forth with layouts and approvals.

- **DETERMINE THE TIMELINE FOR DEVELOPMENT TO PRINTING:** Once the decision on how to produce the book is made, a timeline will be essential. Start at the beginning of the school year, then plan for time to train teachers prior to it. Before that training, you will need at least 6 months for printing for a large-scale project. This will dictate when the print-ready file must be final and approved by the government. Make sure you account for the time needed for the approval process, as this can take months.

- **PREPARE FOR LAYOUT:** Designing the layout for each book well in advance is very important. Do not wait until the content has been developed to design the layout. This may result in having to cut or rewrite content. When designing layout consider the following:

- **Book size**—This may be dictated by the government, but ideally a textbook would be B4 size so it is easy for smaller hands to hold. Teacher's guides can be A4 or something that is also easier for teachers to hold.
- **Icons**—These are helpful as an aid for students and teachers to navigate the materials, but should be kept to a minimum to avoid confusion in remembering too many symbols.
- **Appropriate font for students**—This may be stipulated already by government policy.
- **Font size**—Textbooks should have a larger font for younger students. Font size in the teacher's guide should not be too small to read.

- **PREPARE FOR ILLUSTRATIONS:** This is another essential piece that cannot wait until the content is completed. As soon as possible hire several local illustrators and have them begin working on the illustrations needed for the textbook in particular. Writers at the writers' workshop should develop illustration briefs to explain what illustrations are needed. The work can begin almost immediately once the briefs are complete.
- **DECIDE ON BLACK AND WHITE VERSUS COLOR:** Decide on color or no color. Color is often more engaging for students and can be used to highlight vocabulary words or indicate specific instructions to teachers. However, color will cost about 4% more to print each book for a large-scale print run.

Plan, Plan, Plan—Be sure that before any work begins there is a clear plan that includes all steps and sufficient time for each. In particular make sure there is adequate time planned for moving all content into the layout. This process will most likely involve a couple of rounds of review and revision, working closely with graphic designers and the technical team, and can take longer than expected.

Plot out the book—One useful tool is an Excel spreadsheet for the whole guide, much like for the scope and sequence. Laying out in Excel each activity for each day with the script and content will allow you to see how scripts grow shorter over time. This can be very helpful to the graphic designers as well when they go to move content into the layout. It will help track the content for each lesson and ensures consistency across similar activities when you can see the whole book at a one time.

Proofreading—Plan for time to thoroughly proofread the books once the content has been placed in the layout. This is a crucial step to avoid printing any mistakes. If possible hire professional, experienced proofreaders. This should not be rushed as it is easy to overlook small mistakes that will be regrettable after printing.

BE SURE THAT BEFORE ANY WORK BEGINS THERE IS A CLEAR PLAN THAT INCLUDES ALL STEPS AND SUFFICIENT TIME FOR EACH

About the symbols in this guide:

Indicates "Red Alert": Something to be aware of and alert to, because it is a common problem

Indicates "Non-negotiable": a must-have

RESOURCES

Example teaching and learning materials (student books and teacher's guides) available to download on Funda Wande's website: https://fundawande.org/learning-resources

Cross-country study on teacher's guides: Effectiveness of Teachers' Guides in the Global South: Scripting, Learning Outcomes, and Classroom Utilization.
https://www.rti.org/rti-press-publication/teachers-guides-global-south/fulltext.pdf

Webinar on materials development, including handouts and links to example materials: https://www.globalreadingnetwork.net/events/resources-teaching-and-learning-early-grade-reading

Video discussing the materials development process in Ethiopia:
https://www.usaid.gov/news-information/videos/node/151041

Example teaching and learning materials available to download on RTI's site:
https://shared.rti.org/resources-by-type

Article on research based instructional strategies teachers should know
https://www.aft.org/sites/default/files/periodicals/Rosenshine.pdf

Complete Series of Structured Pedagogy How-To Guides: https://scienceofteaching.s3.eu-west-3.amazonaws.com/index.html

TECHNICAL EXPERTISE NEEDED

Expert in structured pedagogy for relevant subjects and materials development to provide training and guidance to the writing team (if the writing team is new at developing materials for a structured pedagogy program)

REFERENCES

1 Tusome Early Grade Reading Activity, *Tusome Early Literacy Programme English Teachers' Guide Grade 1*, 2nd ed. (Prepared for U.S. Agency for International Development [USAID] Tusome Early Grade Reading Activity, Nairobi: USAID, 2018. (ISBN: 978 9966 110 05 3)
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3 Siegfried Engelmann, Wesley C. Becker, Douglas Carnine, and Russell Monroe Gersten, "The Direct Instruction Follow Through Model: Design and Outcomes," Education and Treatment of Children 11, no. 4 (November 1988): 303–317. https://www.researchgate.net/publication/232426742_The_Direct_Instruction_Follow_Through_Model_Design_and_outcomes
4 Douglas Fisher and Nancy Frey, *Better Learning Through Structured Teaching: A Framework for the Gradual Release of Responsibility* (Alexandria, VA: Association for Supervision and Curriculum Development, 2008).
5 Norma Evans, Deepa Srikantaiah, Amy Pallangyo, Mary Sugrue, M., and Yasmin Sitabkhan, *Towards the design and implementation of comprehensive primary grade literacy and numeracy programs* (working paper by the Global Reading Network. Prepared by University Research Co., LLC. (URC) under the Reading within REACH initiative for USAID's Building Evidence and Supporting Innovation to Improve Primary Grade Assistance for the Office of Education [E3/ED] Washington, DC: USAID, 2019). https://www.globalreadingnetwork.net/resources/towards-design-and-implementation-comprehensive-primary-grade-literacy-and-numeracy.

Guide authored by **Jessica Mejía and Dr. Wendi Ralaingita**

Structured Pedagogy

GUIDE 5

Teacher Professional Development: Teacher Training

INTRODUCTION

Once the teacher's guide and student books have been developed, the next step is to prepare teachers to use these new materials in their classrooms. In-service training is the best way to do this, and then should be followed by ongoing teacher support. This guide will focus on teacher training events where teachers are brought together to learn the new instructional approach. Guide 6 will talk about the support teachers should receive after the training event.

Teacher training programs should recognize that adults are motivated and learn differently than children. Adults are much more self-directed and want to learn information that is relevant to their needs.[1] Training should take into account what teachers already know and what they need to learn to use the new materials. Also consider the concept of cognitive load or the number of things a brain can attend to at one time. This concept has implications for the amount of content and the importance of teachers leaving the training with familiarity, and maybe even some automaticity, in new teaching activities.[2]

In 2017–2018 RTI undertook cross-national research on RTI teacher training programs to better understand how in-service training is being implemented as well as how it can be improved.[3] This guide uses the findings of that study to explain the best practices of training and training design.

ADULT LEARNING PRINCIPLES

1. Consider what teachers already know
2. Give opportunities to have a say in the content
3. Content should be highly relevant
4. Include practical methods of learning
5. Be immediately applicable

Malcolm S. Knowles, *Andragogy in Action: Applying Modern Principles of Adult Learning* (San Francisco: Jossey-Bass, 1984)

TRAINING CONTENT

One of the first questions to consider when developing a training course is what content to include. Choosing the right content and organizing it in a digestible way, in alignment with adult learning principles, is key to the success of the training. The content should focus on what teachers need to know to implement the new instructional approach, including specific activities teachers will need to teach when they return to the classroom. This practice ensures teachers are going to feel confident to try the new approach in class.

Relevance

The content of each training should be immediately relevant to teachers. Focus on the practical information a teacher needs to be able to teach a new instructional approach, including only activities that will be taught in the upcoming term or semester, not over the whole ensuing year, if possible. Center the training on the teacher's guides, student textbooks, and activities that the teachers will be using in their classes.

Less is more

It is tempting to include everything we want the teachers to know in one training. But, to avoid overload and maintain relevance, reduce discussion of theory. Don't try to bring every element of instruction into one training. Content

CHOOSING THE RIGHT CONTENT AND ORGANIZING IT IN A DIGESTIBLE WAY IS KEY TO THE SUCCESS OF THE TRAINING

should be broken down into small digestible pieces. Focus on new activities one at a time, and incorporate time to practice individual activities, before trying to go through a whole lesson of activities at one time.

Shorter more frequent trainings

Long trainings (7–10 days or more) will likely result in teachers remembering only a small portion of what was taught. **Hold shorter, 3–5 day trainings more frequently**. For example, consider having one slightly longer training (5 days) to start the school year and two shorter trainings (3 days) during school breaks to refresh and add new skills. Doing this also gives the program a chance to adapt subsequent trainings to teachers' needs. It helps ensure that trainings are based on what teachers already know, that they can have a say in the content and includes content they need to immediately apply, in keeping with adult learning principles.

TRAINING MANUAL

When undertaking large-scale teacher trainings with possibly tens of thousands of teachers, it is easy for key messages to get lost. A good training manual can help keep the message consistent throughout each level of training. Here are some characteristics of a high-quality teacher manual.

GOOD TRAINING MANUALS CAN HELP KEEP THE MESSAGE CONSISTENT

Short and concise

Keep the manual as brief as possible and only write out definitions or key ideas. Use bullets and textboxes to save space, but highlight key ideas.

Use examples from the Teacher's Guide

Have teachers use the actual program teacher's guide and lesson plans in the training. Take time to show teachers around the teacher's guide; explain icons and the general format. Then, for every opportunity to model an activity and have teachers practice an activity, use a specific example from the guide. Teachers will grow familiar with the teacher's guide or other documents while they are learning the new instructional practices.

Include sufficient time for each activity

Make sure trainers know exactly how long each activity is supposed to take. An agenda at the beginning of the training manual is helpful; even more helpful is giving the time allotted in each section or activity heading in the training manual.

Plan for buffer time

Even the best planned training with the most experienced trainers can end up off schedule. Teachers will ask questions, visiting government officials may talk longer than expected, or some technology will fail. Plan for extra time by adding more time than is really needed or by having activities like energizers that can be skipped if needed. Indicate which activities are optional in case they need to be skipped.

Include ministry counterparts as much as possible

The development of the training manual is a good opportunity to include appropriate ministry counterparts. Getting the ministry involved at this stage will help with government leadership, understanding of the instructional approach, and sustainability. Participating ministry counterparts can also supervise the training and help communicate the importance of the training, which may lead to more motivation among teachers.

TRAINING METHODS

Training methods are the instructional activities used to present the content in a training. Typically, there are four main methods used in training—lecture, discussion, modeling, and practice, which will be explained in this section. How the content is presented is as important as the content itself. Adult learning should include practical methods of learning; adults learn best by doing. Consider how to get teachers to "do" the instructional approach while in training so they can confidently try new skills in the classroom.

HOW THE CONTENT IS PRESENTED IS AS IMPORTANT AS THE CONTENT ITSELF

Practice

This is the most essential methodology to teach new instructional skills for two main reasons. First, having a concrete idea of what activities look and

feel like before they attempt them in the classroom will give teachers confidence in their ability to do this successfully. Second, teachers have to attend to multiple issues while also teaching lessons, and the more familiar they are with the steps of the activity they are teaching the better their brains can attend to their students' learning needs during the activity.[4] **More training time should be dedicated to practice than to anything else. This practice should take place in pairs or small groups rather than in large groups**. The importance of small group or pair practice cannot be overstated: Every teacher should have a chance to practice every activity. The RTI study found that on average only 60% of teachers were able to practice an activity in training because most of the practice was done in large groups, allowing only one or two teachers to practice in the allotted time. Thus making time to practice each new activity and making the practice in pairs rather than groups will ensure every teacher has time to sufficiently practice.

Modeling

Key to understanding a new activity is seeing what it is supposed to look like. Having a high-quality model of each activity will help give teachers an idea of what they are aiming to do in their teaching. A high-quality model may be better done by a very good teacher than by a trainer.

Discussion

The best use of discussion is answering questions teachers have and allowing teachers to discuss their own practice, both in the classroom and during training, to help each other solve challenges. Discussion can also serve as a chance for self reflection or self evaluation. It is easy for discussion to take more time than planned, so balancing discussion and time is key.

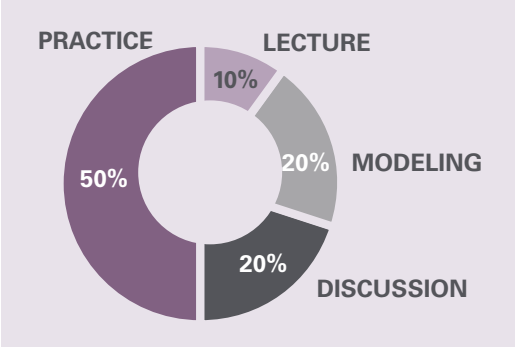
Lecture

Lectures may be necessary to explain concepts and definitions of terms; however, they are also the least effective for helping teachers prepare to teach new skills and activities. Keep lecture time to a minimum.

Given these four main methodological options, how do you decide how often to use each? RTI's internal study found that teachers prefer practice and modeling, and projects with successful student outcomes tend to use more practice in their trainings.

Figure 1 shows one way to consider how to divide the time between the four methods, though the best option will depend heavily on the content.

FIGURE 1. Suggested training time allotments



"I FEEL CONFIDENT. MODELING AND DO IT PRACTICALLY AND YOU DON'T FEEL SHY YOU CAN TEACH LIKE ANY OTHER TEACHER. MADE ME FEEL CONFIDENT."
TUSOME TEACHER

TECHNOLOGY AND TRAINING METHODS

There are many ways to consider including technology as part of a training, such as PowerPoint to present a concept, or video to help model an activity. **However, before designing any technology-dependent activities, consider carefully the context and the participants' technology literacy**. Will the venue have access to electricity? Wifi? How big is the space? Are ALL participants used to using smart phones? Tablets? Depending on the answers to these questions, some or no technology may make sense. Whatever decisions are made should take into account that technology should be a tool for learning, not the main focus.

TRAINING PLANNING AND LOGISTICS

Planning for a teacher training, especially a large-scale, multi-level training, must START EARLY. There are several key decisions and moving parts to juggle, so the more time you have to prepare, the more likely you will be able to adjust when a major issue comes up. Effective training programs work within government systems to align the training timing to the overall master calendar of teacher training to reduce overlap. Key decisions include:

Cascade or no cascade

This is an important first decision to make. In a cascade model of training, master trainers train teacher trainers, who then train teachers. Cascade levels can vary depending on the number of teachers and time available. A no cascade model would mean that one group of trainers would train teachers directly which may take much longer depending on the number of teachers to be trained and skill level of trainers. Cascades can train a lot of people relatively

quickly, but the more trainers and levels of training there are, the more the message can get diluted. In some contexts, a cascade may be the only option. Reduce the number of levels and ensure that all the levels get the same training. The simplest way to decrease the number of levels is to spread out the trainings over a longer period of time so that more experienced and skilled trainers provide the first levels of the cascade over a wide geographic area. Do your best not to cut the training short for the higher levels of trainers. Also plan for 30 teachers maximum per 2 trainers, if possible. The fewer teachers the better, but this depends on the teacher population and ratio to pedagogical support officers.

Who comes to the training

Any teacher who is going to be implementing the instructional approach should attend the training. Sometimes schools or programs decide to train only one teacher per school, hoping that teacher will train other teachers. There are two issues with this. First, the teacher will not be an expert on the content or training methods after one training. Second, there is no way to ensure that teacher trains others well—or at all. Head teachers or school directors also should attend at least part of the training. The more they know about the instructional approach, the more they can help support it. An added bonus is that having more than one teacher attend training means teachers can support each other after training while learning to apply the new practices in the classroom.

Mobilization plan for trainers

When planning trainings, especially for large scale, it is essential to have a clearly laid out plan for each trainer, including location, dates, and level of training. Large-scale training rollout can involve hundreds of people traveling to venues throughout the country. Keeping track of who goes where on what day requires a thoughtful system and tools, such as Excel tables.

Quality assurance

Ensure that the message stays the same throughout all levels of the training. **Every training must have a support person who can provide quality assurance**. This should be someone who has experience training, generally an experienced program or ministry staff member who can support other ministry staff while training teachers. This person should be able to recognize any issue with the quality of training and even jump in to help train when needed. Develop a simple checklist or tool that the quality assurance person can use to gather data on how the training is going. This will help relay any challenges and fix them immediately.

Residential or nonresidential training

Choosing between having teachers stay onsite or traveling back and forth to the training site should be carefully thought out. One study by the Literacy Achievement and Retention Activity in Uganda looked at the advantages and disadvantages of both options.[5] The study compared costs as well as hours of training and amount of learning . It found that the residential training was much more expensive and, in the end, actually did not increase teacher knowledge. The additional cost for the residential training did not turn out to be worth its marginal impact.

Training of trainers

Trainers most affect a training's success. They should experience the training as they will give it, so they know it. Supplemental content focusing on how to give constructive feedback and adult learning and facilitation will be important. Chances are trainers will not be experienced primary teachers or have expertise in foundational literacy/numeracy, so the training they receive will be essential to the success of the teacher training. Training is exhausting; as much as possible, plan for two trainers per training. Use ministry trainers or other appropriate staff as trainers. They may not be experts in the content, but with practice-based training and quality assurance they will be effective. Teacher coaches could be trainers, also. See Guide 6 on ongoing support for more on teacher coaching. This will help them develop relationships with teachers and deeply understand the instruction. Or, consider using very skilled teachers as models and trainers. Teachers make excellent models, and they understand the classroom best.

CONSIDER USING VERY SKILLED TEACHERS AS MODELS AND TRAINERS

While this guide has focused on how to prepare and deliver a high-quality in-service training within a structured pedagogy program, it will be important to ensure that sustainability is woven throughout. Collaborating with ministry officials and staff throughout, as discussed, will help. In addition, effort should be made to ensure that the training program can be incorporated into the government system, including providing credit to teachers and identifying opportunities to integrate the approaches into teacher training colleges

For more information on Data, Accountability and Systems, please visit:

GUIDANCE NOTES

In 2017–2018 RTI undertook cross-national research on RTI teacher training programs and summarized the findings with the following guidance:

Essential Guidance for Training:

1. Reduce the amount of content in the training.
2. Increase time allocated to modelling and practice.
3. Modelling of skills should be done by competent facilitators.
4. Format the training manual to maximize ease of use.
5. Teach time management techniques to facilitators and program staff.
6. Ensure facilitators understand the program theory of change.
7. Training manuals, teachers' guides and student textbooks should be key resources.

Suggested Guidance for Training:

8. Training manuals should provide specific, simple and clear guidance.
9. Include buffer time when allocating time in the training manual.
10. Follow the training manual at Master Training and Training of Trainer levels.
11. Establish criteria for the selection of facilitators.
12. Emphasize the 5 components of reading and writing

CONCLUSION

These best practices design training to be as successful as possible. Keeping in mind the context and principles of adult learning throughout the process will help ensure teachers are ready to use the new materials in their classroom once training ends. It is important to remember, however, that this takes time: teachers will not be able to implement perfect lessons in the first week or even term. Learning and perfecting new instructional practices require consistent feedback. These best practices, summarized in the guidance notes above will go a long way toward helping teachers get as much as possible from the training.

About the symbols in this guide:

Indicates "Red Alert": Something to be aware of and alert to, because it is a common problem

Indicates "Non-negotiable": a must-have

RESOURCES

CIES 2019 presentation Training teachers or robots: Unexpected findings of a 7-country teacher professional development study: https://shared.rti.org/content/training-teachers-or-robots-unexpected-findings-7-country-teacher-professional-development

Darling-Hammond and Richardson on "Research Review/Teacher Learning: What Matters?": http://www.ascd.org/publications/educational-leadership/feb09/vol66/num05/Teacher-Learning@-What-Matters%C2%A2.aspx

Knowles on *Andragogy in Action: Applying Modern Principles of Adult Learning*.

CIES 2019 presentation Small non-residential trainings vs. large residential training: https://shared.rti.org/author/tiguryera-s

Webinar on in-service training and ongoing teacher support: https://www.globalreadingnetwork.net/events/continuous-professional-development-early-grade-reading-programs

Complete Series of Structured Pedagogy How-To Guides: https://scienceofteaching.s3.eu-west-3.amazonaws.com/index.html

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2 David F. Feldon, "Cognitive Load and Classroom Teaching: The Double-Edged Sword of Automaticity," *Educational Psychologist* 42, no. 3 (December 5, 2007): 123–137, DOI: 10.1080/00461520701416173 https://www.researchgate.net/publication/232817919_Cognitive_Load_and_Classroom_Teaching_The_Double-Edged_Sword_of_Automaticity
3 Benjamin Piper, Jessica Mejia, Jennifer Spratt, Yasmin Sitabkhan, Kellie Betts, Patience Sowa, and Wendi Ralaingita, T*eacher Professional Development in Low- and Middle-Income Countries: Results of the 17-Country Teacher Study Examining Survey Findings, Training Manual Analysis, and Observations of Teacher Training* (Research Triangle Park, NC: RTI Press, forthcoming).
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Guide authored by **Jessica Mejía**

Structured Pedagogy

GUIDE 6

Teacher Professional Development: Ongoing Teacher Support

INTRODUCTION

Teacher training events for structured pedagogy (SP) programs, as described in Guide 5, are important for introducing new techniques and approaches, familiarizing teachers with new materials, and preparing them to try these new approaches. A one-time training, however—or even a series of isolated training events—typically will not change teacher practice significantly.

After a teacher training event, targeted ongoing teacher support (i.e. external or in-school coaching, communities of practice, remote support via digital technology) helps to ensure that teachers are using the materials appropriately, and it increases fidelity of implementation. Ongoing support also contributes to teachers' motivation to implement, by increasing their confidence in implementing the new practices, because follow-up from the head teacher or education officials signal leadership and expectations for implementation, and because they often feel more connected and enthused as they see their students' improvement.

Guide 5, Teacher Professional Development: Teacher Training, focused on teacher training events, where teachers are introduced to new techniques, approaches, or materials. This guide focuses on providing ongoing support to teachers after such an orientation and lays out steps for the design and implementation of an ongoing support model.

STEP 1. DESIGNING THE ONGOING SUPPORT MODEL

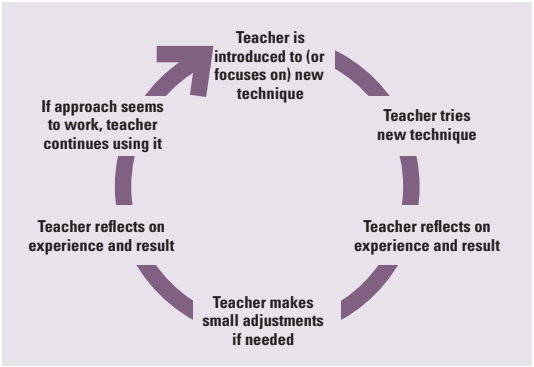
Focus on Teacher Needs and ongoing support

Recognize how teachers learn and change their practice. This learning moves through an iterative cycle of trial and reflection (see Figure 1).[1] Ongoing support can help teachers to:

- **Just try it**. Encourage teachers to try out a new technique (e.g., using a gradual-release model such as "I do, We do, You do" to listen for and identify initial sounds) and ensure that they apply it as per the training manual and teachers' guide.
- **Persist after the first try.** Help teachers to troubleshoot challenges they encounter when trying the practice in their context (e.g., it is harder to do with this big class than I realized. What can I do?).
- **Observe how it works**. Support and guide teachers to reflect on what happens when they use the practice (the children are enthusiastic, the children are getting better at hearing the initial sound, etc.).
- **Decide what's next.** As teachers improve or master a particular technique, help them to decide what to focus on next for improvement (e.g., initial sounds are now going well, but blending and segmenting are still difficult).

When teachers see that the new practice works, they will continue using it. Ongoing teacher support aims at that ultimate goal.

FIGURE 1. Teacher learning cycle



Consider Possible Modalities

Given the type of support needed, as described above, consider modalities for providing it. Common modalities include:

- **Coaching**. This might be within-school coaching, where a designated "coach" (head teacher, senior teacher, etc.) observes the teachers and carries out post-observation discussion. Or it could be external coaching, where a "coach" from outside the school (a pedagogical supervisor for a cluster of schools, or similar) supports multiple schools, visiting schools to observe and have discussions with teachers and head teachers to reflect on their instruction.
- **Community of practice (CoP)**. Teachers meet to discuss their practice, troubleshoot, and reflect together. Meetings may take place among teachers within a school, or involve teachers from a cluster of schools.
- **Remote support using digital technology**. Various types of support may be provided at a distance through low- or high-tech means. For example: radio programs that share teacher tips, videos that teachers can view on their own, telephone calls, text messages, or online apps such as Skype or WhatsApp.

Most programs use a combination of modalities, and there is research evidence that combining multiple mechanisms is likely to be most effective.[2] However, the effectiveness of any modality, or any combination, will depend on the context and the quality of implementation.

There is strong evidence for the value of coaching; rigorous quantitative research has shown an impact on students' learning outcomes when coaching is used.[3] Few systematic studies have examined CoPs and their impact on learning outcomes, so there is currently less evidence for relying on them as the primary support mechanism. However, qualitative studies have shown that CoPs are valuable opportunities for teachers to reflect and find ways to resolve challenges,[4] indicating that CoPs may be valuable as one part of a support model. As explained by a teacher in the Tusome Early Grade Reading Activity in Kenya, CoP meetings allowed them to "discuss the challenges facing the teachers in classrooms, so when you come to class, you improve the teaching methods."

In the Early Grade Reading Study in South Africa, Cilliers et al. (2018) found that students exposed to two years of the program improved their reading proficiency by 0.12 standard deviations if their teachers received only centralized training, compared to 0.24 if their teachers received in-class coaching.

Whatever combination of modalities you select, **it is essential to ensure that teachers can be observed and given constructive feedback, and that teachers have opportunities to reflect on their experience with new practices**.

In a qualitative study of school cluster teacher meetings in South Africa, Jita and Mokhele (2014) found that these reflection meetings seemed to enhance teachers' content knowledge and knowledge of instruction. Cluster meetings also offered "process benefits," which included collaboration, instructional guidance, and teacher leadership.

TABLE 1. Teacher Support Modalities: Pros and Cons

Modality	Pros	Cons
In-school coach	Relatively inexpensive. Allows for frequent observation/feedback. Can help ensure school-level commitment.	School administrators often are too overloaded to handle this role. Difficult to monitor. May involve extra training and support for school staff to take up role.
External coaching visits	Coaches can have higher-level training and can be a conduit for other experts to provide additional information.	Expensive. If coach-to-school ratio is high, or if travel is difficult between schools, teachers may receive few visits.
School-level teacher learning groups	Inexpensive approach. Can create a positive school environment for trying new approaches.	Less effective if only a few teachers per school. Without enough support, meetings can lose focus or reinforce misconceptions.
Cluster-level teacher learning groups	Can be relatively inexpensive and can energize teachers. Can be effective for finding solutions to problems or issues.	Groups need time and a budget for teachers to meet. Also need support and technical input to ensure that joint solutioning is technically sound.
Support via digital technology	Can help to bridge gaps where frequent in-person communication is not possible, or where an expert cannot visit all schools frequently.	Most effective combined with other approaches. Connectivity and access to digital devices must be taken into account.

Consider the Context

Examine the context to determine the following.

- **Existing resources**. Are mechanisms for teacher support already in place, or were some in place previously? Examples might be government system options, or mechanisms implemented by nongovernmental organizations. If the answer is yes, learn what has or has not worked, and build on that knowledge.
- **Logistical considerations**. What are the limiting (or enabling) characteristics of geography, demography, and staffing? For example: Are schools close together, such that a coach could easily travel among them, or does it take days to travel? Do head teachers also have full teaching loads? Does the education system have existing pedagogical support positions and are they fully budgeted? Would internet or phone connectivity allow for support through digital technology?

In many countries, the responses to these questions will differ by location, so you may need a flexible model. For example, in the Terai (lowland) region of Nepal, schools are many and close together, so external coaching and cluster-level CoPs may make sense. In the Himalayan mountain regions, on the other hand, schools are often far apart and difficult to travel among because of terrain and climate. In such situations, combining in-school coaching with periodic external support visits and virtual communication might be more appropriate.

STEP 2. PLANNING FOR OPERATIONALIZATION

Once you have some idea of possible modalities and a sense of the context, you can turn next to planning the operational details to fill in the design. When doing this, keep sustainability—i.e., the capacity to continue the SP programming over the long term, with government resources only—front and center.

Operational Research and Monitoring

Understanding what has worked in the past is a good place to start. Monitoring during roll-out of the new teacher support model will help you find out where implementation needs to be strengthened. For example, if monitoring data shows that coaches are not observing lessons regularly, you can then identify obstacles and address them so that observations take place. Operational research can help you to identify ways in which you may need to revise the model to ensure sustainability.

Budget Considerations

Be realistic about the budget but also technically sound. Many externally funded programs have extensive support built in. Even if they show good results, however, such options may be too expensive for governments to take on later. In other words, these support models may be technically sound but budgetarily unrealistic. Vice versa, government systems often undercut the budget for teacher support to the point of being ineffective. These options may be budgetarily realistic but not technically sound.

You can work with the government to identify cost-effective approaches—such as efficient approaches for travel reimbursement—that still allow for sufficient support to teachers. During this process, also try to balance planning for sustainability with injecting funds for start-up and proof-of concept. As the program rolls out, try to have ongoing dialogue with the government to advocate for safeguarding sufficient budget for teacher support. Working closely with the government on the teacher support model and having them see positive results will contribute to that dialogue.

Human Resources

As much as possible, the teacher support model should use existing government positions. When external programs directly hire new coaches, those coaching positions, and the personnel who fill them, rarely transfer later into the government system. **At the same time, many government systems have positions that originally were meant to provide pedagogical support but have become more administrative and overburdened with other responsibilities**.

To re-envision these positions for providing teacher support, consult with government counterparts to encourage them to revise or develop new job descriptions (see Guide 1 on government leadership and teacher adoption). Or if the system has coaches, assess whether it would be feasible to reduce the number of schools for which each coach is responsible. Finally, sometimes staff in such

OPERATIONAL RESEARCH CAN HELP YOU TO IDENTIFY WAYS IN WHICH YOU MAY NEED TO REVISE THE MODEL TO ENSURE SUSTAINABILITY

positions see themselves and as seen by school-based staff, as "inspectors" rather than as coaches or mentors. If this is the case, they will need strong training and support to shift their focus.

Accountability and Incentives

As discussed in Guide 7 on data, systems, and accountability, you will need to work with the government to ensure that the teacher support system is tied to accountability mechanisms. In that way, you can monitor coaching and CoPs, lines of responsibility are clear, and you can provide targeted support if implementation falters. Ensure incentives for the actors in the support system are in place, as they do the hard work of changing instruction. This can include, for example, credit for training, promotion or recognition for becoming a coach or CoP facilitator, and awards or letters of recognition.

STEP 3. FILLING IN THE TECHNICAL DETAILS

Once the basic teacher support design is iterated, you can fill in the details. This section focuses on coaching/mentoring, CoPs, and incorporating digital technology. Many of the instructions suggested here stem from a 2018 study that RTI International undertook of ongoing teacher support in large-scale SP programs internationally, which resulted in guidelines for implementing coaching and CoPs.[5]

Coaching/Mentoring

- **Train and support coaches**. Coaches need training and support on both instructional methods and coaching skills. Train the coaches to develop a relationship with teachers that is based on mentorship, rather than on evaluation or inspection. Guide them not to tell teachers what to do, but instead to listen and let teachers think about their own practices. This needs to be a frequent target of training and support to coaches.
- **Use observation tools that are short, simple, and centered on key instructional elements**. Design the tools to focus on the most essential aspects of the lessons and to target key instructional practices. Make these tools simple, direct and easy for coaches to use and focused on constructive support rather than inspection or evaluation.
- **Prioritize instructional behaviors in a phased manner**. Begin with skills that will be easier for teachers to master and move to more difficult ones over time — such as starting with routines for introducing letters, eventually building to how to create good comprehension questions (as per the teacher learning cycle, Figure 1). Whenever possible, focus on improvement areas that teachers themselves have also noted.
- **Ensure that coaches' post-observation debriefing sessions include teacher reflection and discussion about what worked well and what to focus attention on**. Coaches should first give teachers a chance to reflect on their lesson. Then, coaches should share positive feedback. Finally, coaches, with teachers, identify two or three areas for improvement that are clear, specific, and actionable.
- **Consider including brief student assessments during coaching visits**. Plan for coaches to assess a small sample of students after each classroom observation visit, taking not more than five minutes total, such as choosing three grade one students and asking them to read five random words from the lesson. These interactions will give the coaches an idea of student progress, which they use to help teachers make instructional decisions.

"I HAD LEARNED THE SKILLS IN THE TRAINING, BUT IT IS [COACHING] THAT MADE ME CONFIDENT IN APPLYING THEM. I WAS LOST AT FIRST BUT THE [COACH] GUIDED ME." - TEACHER IN NEPAL DISCUSSING THE NEGRP TEACHER SUPPORT SYSTEM

Communities of Practice (COP)

- **Provide training and support for COP facilitation**. Train CoP leaders or facilitators on key instructional practices as well as setting CoP agendas, and running effective COP sessions. **It is easy for CoP meetings to lose focus, to allow logistical and administration concerns to overtake pedagogical ones, or to be conflated with staff meetings**. Monitoring and follow up is needed to help avoid this, or redirect both the leaders and the meetings if these distractions start to happen.

- **Ensure cluster meetings are well structured**. Guidance provided to CoPs should provide enough structure to facilitate constructive meetings, while allowing some flexibility and choice by participants. An agenda framework could include examples of activities, as well as suggestions for topics. Activities might include:
  - Lead a conversation for reflection and discussion (with sample reflection questions)

- Identify a common challenge and brainstorm solutions — such as how to assess students in a large class, or how to make sure all students participate
- Demonstrate teaching a lesson, and give feedback
- View and discuss model (or teacher-recorded) videos

- **Provide access to additional technical support if/as needed**. Teachers gain a lot from sharing experiences among themselves, but they also need access to an individual with more expertise in targeted instructional practices, to whom they can turn for help. This advisor also can ensure that teacher-developed solutions are technically sound. This person might not attend CoP meetings but would be a resource to call upon as needed, or to touch base with the CoP periodically. If your program's design will combine CoPs with coaching, a coach/mentor could serve in this capacity.

Promising Digital Technology Approaches

Digital technology may offer cost-effective ways to enhance support. Some promising examples are:

- Coaches use **SMS** (text messaging) to send reminders and tips and to answer teacher questions.
- Teachers hold CoP conversations virtually, through **platforms such as WhatsApp, Viber, or Skype**.
- Teachers access learning modules and interactive dashboards, according to their needs and interests, through **interactive voice response** and **online learning platforms**.

CONCLUSION

Will teachers try and then continue to use the instructional practices that are integrated into materials and introduced during training? The answer to this question lies at the heart of implementation. If most teachers do not try using the structured pedagogy materials, or they give up after one or two tries of a new technique from the training, the program will not have the intended impacts on students' literacy and numeracy.

Ongoing teacher support will help to ensure that this key piece of the structured pedagogy puzzle falls into place. Although there is not one magic teacher-support formula that will work everywhere, as this guide has discussed, you can learn enough from experience and research to make good decisions about what is likely to be feasible and technically sound in a given context. Then plan to introduce monitoring and operational research to verify that teachers receive the ongoing support they need to be successful, and to make the SP program impactful.

About the symbols in this guide:

Indicates "Red Alert": Something to be aware of and alert to, because it is a common problem

Indicates "Non-negotiable": a must-have

RESOURCES

Craig, Kraft and du Plessis provide an overview, with examples, of best practices in teacher training and support: https://people.umass.edu/educ870/teacher_education/Documents/Craig-book.pdf

Global Reading Network resource providing recommendations for and discussing examples of strong coaching programs: https://pdf.usaid.gov/pdf_docs/PA00TXZ9.pdf

Volume, edited by Pouezevara, of research case-studies covering a variety of ongoing support models: https://www.rti.org/rti-press-publication/cultivating-dynamic-educators

Piper, Mejia, and Betts present on a cross-country research study on coaching and CoPs. *Do's and Don'ts of Improving Teaching Through Instructional Support: Findings from a Multi-Country Study of Coaching and Communities of Practice*. Paper prepared for the annual meeting of the Comparative and International Education Society.

Funda Wande: teaching videos that might be used during CoP meetings for discussion, as well as videos that show teachers discussing their practice with each other: https://fundawande.org/video-resources

Video from the United States Agency for International Development (USAID), describing the effective use of combined in-person and virtual coaching in the Global South, and showing some of this coaching in action. https://www.usaid.gov/news-information/videos/coaching-teachers-south-africa-produces-results

Complete Series of Structured Pedagogy How-To Guides: https://scienceofteaching.s3.eu-west-3.amazonaws.com/index.html

TECHNICAL EXPERTISE NEEDED

Experts in the target instructional practices and in teacher professional support—for the design phase and then again for development of tools and training.

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1 The model in Figure 1 is based on models presented in: Guskey, Thomas R. 1986. "Staff Development and the Process of Teacher Change." *Educational Researcher* 15, no. 5: 5–12; Kolb, David. 1984. *Experiential Learning: Experiences as the Source of Learning and Development.* Upper Saddle River, NJ: Prentice Hall; and Smith, Margaret Schwan. 2001. *Practice-Based Professional Development for Teachers of Mathematics.* Reston, VA: National Council of Teachers of Mathematics.

2 See, for example: Craig, Helen J., Richard J. Kraft, and Joy du Plessis. 1998. *Teacher Development: Making an impact.* Produced for USAID under the Advancing Basic Education and Literacy Project; and for the World Bank by the Human Development Network, Effective Schools and Teachers. Washington, DC: Academy for Educational Development (AED) and World Bank. https://people.umass.edu/educ870/teacher_education/Documents/Craig-book.pdf; Darling-Hammond, Linda E., Maria E. Hyler, and Madelyn Gardner. 2017. *Effective Teacher Professional Development.* Palo Alto, CA: Learning Policy Institute. https://learningpolicyinstitute.org/sites/default/files/product-files/Effective_Teacher_Professional_Development_REPORT.pdf; Westbrook, Jo, Naureen Durrani, Rhona Brown, David Orr, John Pryor, Janet Boddy, and Francesca Salvi. 2013. *Pedagogy, Curriculum, Teaching Practices and Teacher Education in Developing Countries.* Final Report. Education Rigorous Literature Review. Prepared by the Centre for International Education, University of Sussex. London: UK Department for International Development. https://assets.publishing.service.gov.uk/media/57a08a13ed915d622c000054f/Pedagogy-curriculum-teaching-practices-education.pdf

3 Examples of such studies include: Cilliers, Jacobus, Brahm Fleisch, Cas Prinsloo, and Stephen Taylor. 2018. *How to Improve Teaching Practice? Experimental Comparison of Centralized Training and In-Classroom Coaching.* RISE Working Paper. https://riseprogramme.org/sites/default/files/publications/RISE_WP-024_Cilliers_TeachingPractice.pdf; Piper, Benjamin, Stephanie Simmons Zuilkowski, Margaret M. Dubeck, Evelyn Jepkemei, and Simon J. King. 2018. "Identifying the Essential Ingredients to Literacy and Numeracy Improvement: Teacher Professional Development and Coaching, Student Textbooks, and Structured Teachers' Guides." World Development 106, June: 324–336. https://doi.org/10.1016/j.worlddev.2018.01.018.

4 For examples see: Pouezevara, Sarah R., ed. 2018. *Cultivating Dynamic Educators: Case Studies in Teacher Behavior Change in Africa and Asia.* RTI Press Publication No. BK-0022-1809. Research Triangle Park, NC: RTI Press; Jita, Loyiso C., and Matseliso L. Mokhele. 2014. "When Teacher Clusters Work: Selected Experiences of South African Teachers with the Cluster Approach to Professional Development." South African Journal of Education 34, no. 2: 1–15. https://doi.org/10.15700/201412071132; Foundation for Educational Change (FEDUC). 2020. *Study on Effectiveness of Teacher Professional Support System in Early Grades.* Final Report. Prepared for USAID under the Early Grade Reading Program in Nepal, Contract No. AID-367-TO-15-00002. Research Triangle Park, NC: RTI International.

5 Piper, Benjamin L., Jessica Mejia, and Kellie Betts. 2020. *Do's and Don'ts of Improving Teaching Through Instructional Support: Findings from a Multi-Country Study of Coaching and Communities of Practice.* Paper prepared for the annual meeting of the Comparative and International Education Society.

Guide authored by **Dr. Wendi Ralaingita**

Structured Pedagogy

GUIDE 7

Data Systems and Accountability

INTRODUCTION

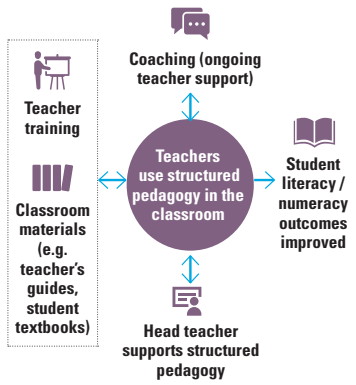
Timely data that are fed back into the system are needed to hold key actors accountable for the implementation of structured pedagogy interventions, to measure the impact of these interventions on teachers' practice, to identify and inform program adaptations and, most importantly, to show what, if any, impact the intervention is having on key programmatic outcomes (such as students' basic literacy and numeracy skills).

The following questions should be used to guide decisions and discussions around data use and accountability for the successful implementation of structured pedagogy interventions to promote foundational literacy and numeracy:

1. What data should be collected?
2. Who should be responsible for collecting data, and how often should data be collected?
3. How will the data be used, and who needs access to results?

To provide concrete and specific guidance, we have developed as an example a simplified structured pedagogy program theory of change to be used as a reference point throughout this section. A program's theory of change should drive decisions regarding the data to be collected. If a program theory of change is not available, one should be developed before determining what data to collect.[1,2]

FIGURE 1. SIMPLIFIED EXAMPLE THEORY OF CHANGE FOR A FOUNDATIONAL LITERACY OR NUMERACY STRUCTURED PEDAGOGY PROGRAM



WHAT DATA SHOULD BE COLLECTED?

As a starting point for determining key data collection requirements, we recommend focusing on the main components of your program's theory of change. For the example program in Figure 1, these are represented by the activities, inputs and outputs displayed in the graphic. **These critical data will allow you to determine whether or not program activities are being implemented and whether the goal of the program is being achieved**. Additionally, collecting data on the mechanisms through which each component affects other, ensuing components in the theory of change is essential. In Table 1, we provide examples of basic indicators, most of which are relatively easy to collect data on, for each of the components in the Figure 1 theory of change.

TABLE 1. Example indicators based on program theory of change

Program Component	Example Indicators
Teacher training	• Number of teachers trained, by sex • Proportion of teachers demonstrating increased knowledge of structured pedagogy best practices (pre vs. post training).
Classroom materials	• Number of classroom materials (e.g., teacher's guides and student textbooks) delivered to schools on time • Proportion of teachers observed with teacher's guide • Proportion of students with student textbooks in the classroom
Coaching	• Proportion of teachers observed by coach at least one time per term
Head teacher support	• Proportion of teachers observed by head teachers at least one time per term
Teachers' use of structured pedagogy in the classroom	• Proportion of teachers using teacher's guide during lesson • Proportion of teachers meeting expectations for time on task • Proportion of teachers demonstrating high-quality techniques (e.g. questioning, remediation, formative assessment) with proficiency
Student literacy/ numeracy outcomes	• Proportion of students reading with fluency and comprehension or meeting mathematics benchmarks, by sex

Most of the indicators in Table 1 focus on "low hanging fruit". In order to get to the crux of the intervention — how teaching and learning is changing, and how that change is effecting students' literacy and numeracy outcomes — you should develop a learning agenda consisting of research questions that determine whether or not (as well as why or why not) key components of the program are being implemented as intended. For example, while the proportion of teachers using teacher's guides is a standard indicator for structured pedagogy programs, a clear understanding of whether teachers have prepared for lessons and the pace of their lesson implementation is also critical.

Include learning agenda questions that will help continually improve your program. In-depth case studies of schools or coaches with greater than average uptake or fidelity of implementation, compared to those with lower than average implementation, will be useful, as will small studies that revisit and provide a comparison point to the student skills review and teacher observations conducted during your initial review of the national curriculum and scope and sequence. Revisit and update the learning agenda, and the theory of change, on an annual basis in order to account for programmatic adaptations stemming from the data collected.

About the symbols in this guide:

Indicates "Red Alert": Something to be aware of and alert to, because it is a common problem

Indicates "Non-negotiable": a must-have

WHO SHOULD BE RESPONSIBLE FOR COLLECTING DATA, AND HOW OFTEN SHOULD IT BE COLLECTED?

Interventions should embed monitoring of data collection in existing government systems. This limits data duplication, increases government leadership, and mitigates the risk of developing a parallel system. Embedding begins with three main steps: 1) Engage government counterparts in backward mapping of data needed, according to the theory of change, to data already being collected by the system (to identify new types of data and determine how these may be obtained through government channels); 2) Map the frequency with which data are collected through the system to the timeline of when these data will be needed to inform adaptation and action; 3) Identify potential technologies, such as data dashboards, that will enable rapid data collection, analysis and review through government channels and reporting structures.

Contextualize data needs within existing government policies, plans, and priorities. **This can be a sensitive arbitration, particularly when the desired outcome of a donor or outside expert is at odds with the allocation of scarce resources by government**. For example, you may want local officials to attend a sample of prescribed teacher meetings, for both monitoring and learning purposes. Because these meetings are held in the evening, however, local administrators may push back, citing that limited fuel allowance must be used to monitor teacher attendance in the morning. **Some types of data, such as recurring classroom observations of teaching practice, are so critical to informing activity adaptations that they should be considered non-negotiable**. While this process is beneficial for ensuring that there are built-in lines of accountability for data collected on behalf of your program, an additional layer of external monitoring could be needed to ensure system monitoring is actually taking place. Data collected outside of the system should be publicized to targeted government actors to build demand for these data inside the system. National benchmarks set using externally collected data should be prioritized for communication - using a concrete, simple message that teachers can apply in their classroom, such as "Your grade 2 students should be reading X words per minute, Take time to check students reading, and if they are below this rate, take these three steps

Data collection technologies such as an online reporting dashboards likely will have a high return on investment by 1) decreasing potential long-term monitoring costs to the government, thus increasing the likelihood of regular monitoring; and 2) creating rapid feedback cycles that inform timely adaptations and prevent the allocation of additional resources to activities that are not achieving desired outcomes. **One caveat, and a major pitfall with technology solutions, is regular maintenance**. **You should always introduce dashboards, data collection**

RECOMMENDATIONS -> WHEN RESOURCES ARE CONSTRAINED

IF key data are not being collected through systems

THEN organize events with government to demonstrate the value of the data and encourage their leadership. Use participatory approaches to transition future data collection to government systems.

IF key data are included in government systems but are collected sporadically

THEN supplement this system through modest stipends or external data collectors. With input from local government, develop a reporting dashboard with accurate, real-time data relevant to both government and the intervention to build a reliance on these data and support the data's sustained use.

tablets, offline teacher support applications, or other technologies through the system, and provide ongoing training on technology troubleshooting, installation, programming, maintenance and repair to the relevant information and communication technology officers. If resources are constrained, prioritize dashboards and other online data collection approaches where information needs to be shared rapidly between actors in different locations (i.e. between the school and local government office).

Once data purposes, processes, and timelines are mapped, meet with governing actors at the school, local, and national levels to identify who is responsible for delivery of each element of the structured pedagogy program. Lines of external, organizational, and internal accountability should be clearly drawn at the intervention's inception.

Careful decisions must also be made with respect to the role of a data collector in relation to the nature of the data collection. For example, in many systems, one ministry department will serve as the natural location for both collecting monitoring data and providing support to teachers. If these departments are typically focused more on inspection than on coaching, it would be best to identify other actors who may be available to serve in the teacher support role. Similarly, **school-level actors (or those directly impacted by school-level performance) should not be used to conduct impact evaluations, where independence is essential for ensuring high-quality and reliable data**.

Table 2 shows example purposes for data, potential data collectors, and recommended frequency of data collection for each component of the program in the theory of change example.

TABLE 2. Example data collection assignments and timelines based on program theory of change

Program component	Purpose	Who should collect these data?	How often should these data be collected?
Teacher training	Measure training reach and effectiveness	Teacher trainers	During and after training
Classroom materials	Track materials development, book production, and distribution	Curriculum department (development) Local government (production and distribution)	Content: Initial design and user-testing, before revising Quantity: After distribution, annually
Coaching	Measure coaching reach and effectiveness	Coach supervisors (monitoring) Coaches (self-report through data upload)	Monthly
Head teacher support	Measure frequency and quality of support	Head teacher self-report	Monthly
Teachers' use of structured pedagogy in the classroom	Measure teachers' adherence to/use of materials	Head teacher Coaches	Monthly
Student literacy/ numeracy outcomes	Monitor individual learner progress, target areas of strength/weakness Evaluation: Measure overall learning outcomes	Formative assessment: Teachers* (with coaches) Evaluation: Independent assessors	Daily/Weekly formative assessment; annual evaluation (summative)

* Teacher reported data should be triangulated with third party data to determine reliability and usefulness. Improving the use of teacher reported data (including self-evaluation, self-monitoring and self-reflection data).

HOW WILL THE DATA BE USED, AND WHO NEEDS ACCESS TO RESULTS?

Collecting the right data is important, but data are only as valuable as their ability to effect change and improve the quality of a program's implementation. This can only be achieved by having a clear plan for data use and access, focused on ensuring accountability and on building demand beyond the program itself. **Accordingly, it is essential to provide relevant stakeholders with timely and convenient access to data, findings, and results, so that appropriate action can be taken to improve program performance and ensure that teachers and students are receiving the highest quality teaching and learning opportunities possible**.

Education systems in low- and middle-income countries are typically unable to provide reliable, timely access to data on quality implementation. Therefore, this work requires supporting government information systems to bolster data collection and reporting in ways that align with the job functions of government officers and help them improve the quality of their implementation. In lieu of creating new data collection mechanisms, revise or supplement existing data collection instruments to focus more on quality implementation measures (as opposed to the more typically measured simple inputs such as counting children or teachers). One major challenge interventions face is successfully integrating formative assessment approaches in

Examples of Student Assessments

...that can also be adapted for instructional use

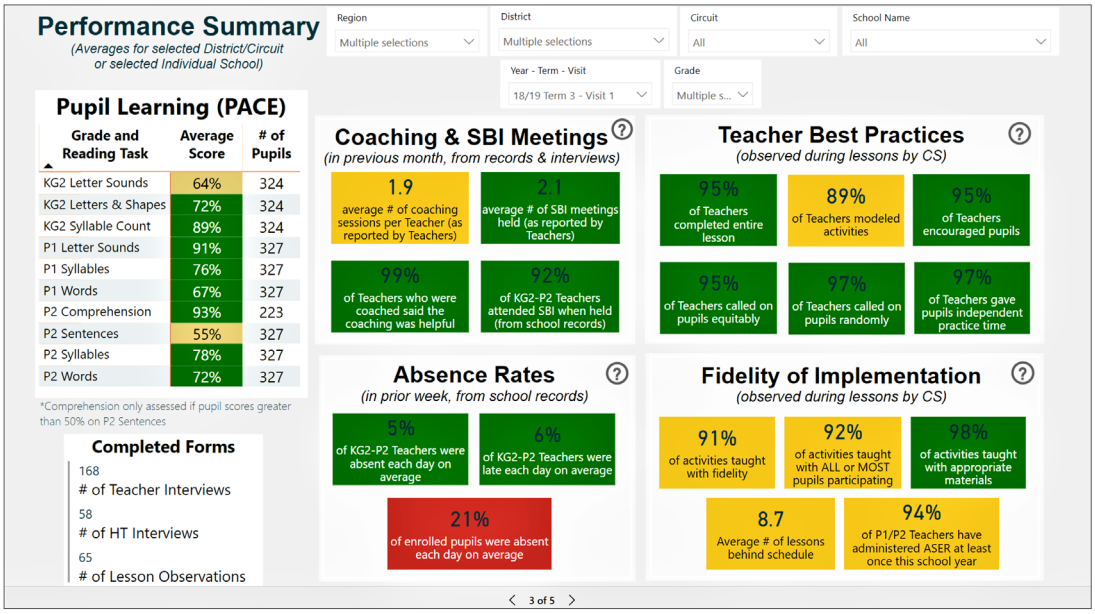
UWEZO National Survey Tool: https://www.uwezo.net/assessment/tools

Pratham Teaching at the Right Level: https://www.teachingattherightlevel.org/the-tarl-approach/assessment/

the classroom that are user friendly, applicable in large classrooms, and drive meaningful decision-making by teachers. The best option towards achieving this is to engage teachers as thought leaders- to design, test, review and revise and disseminate a formative assessment approach.

Additionally, this work should include reliable and continuous avenues for data analysis by, and reporting to government actors at different levels of the system. For example, use dashboards to provide access to real-time data on program implementation activities (from basic indicators such as attendance to quality measures such as coaching and school-based inset (SBI) meetings and fidelity of implementation to key outcomes such as student performance, as shown in Figure 2). Provide users with log-ins that allow differing levels of access depending on their role and the data that would be most beneficial. Furthermore, hold events regularly to share data and results at national and subnational levels. These data-sharing approaches serve to increase accountability by providing performance data up and down lines of management and by allowing for comparisons of performance between and across levels of implementation. This can create healthy competition in areas of implementation essential for program success. Lastly, if these data are then used to improve implementation of the program and increase the effectiveness of government officers' job functions, that success will help build demand for such data beyond the scope of the program.

FIGURE 2. An example dashboard that monitors teaching and learning indicators uses color-coding to highlight strengths and weaknesses in teaching, coaching, and learning outcomes. (CREDIT: FHI 360 GHANA)



As an example, Table 3 shows the implications of data use and accountability for the coaching component of the hypothetical structured pedagogy program model theory of change in Figure 1. The coaching component consists of monthly coaching visits by trained school supervisors, with the goal of ensuring that teachers are receiving sufficient ongoing support to implement the structured pedagogy program as intended.

TABLE 3. Example data use and accountability for structured pedagogy coaching

How will these data be used?	• Track whether coaching visits and ongoing support align with program expectations • Determine teacher use of structured pedagogy materials and procedures in the classroom
Who needs access to these data?	• Head teachers • Coaches • Local, subnational, and national education officers • Program staff
How can these data ensure accountability?	• A data dashboard with frequency of coaching visits allows local education officials to determine if coaches are visiting schools as intended • A data dashboard of teacher observation results allows national-level directors to compare performance across subnational levels • Coaches' responsibility for presenting results to district directors during biannual data-sharing events increases oversight
How can demand be built for these data and results?	• Provide training on use of the dashboard and review of results to high-level decision-makers • Create the norm of conducting regular data-sharing events to generate demand and buy-in based on usefulness of shared data

CONCLUSION

Two critical themes run through this Structured Pedagogy Guide. The first is the importance of accessible, rapid feedback on the implementation of each component of a program. This feedback enables system actors to use this information for accountability and adaptation. The second is the tension between ensuring monitoring and learning mechanisms critical to a successful structured pedagogy intervention are embedded within systems, while taking into account the limited resources and varying priorities of system actors at each level of government. To this end, close collaboration with government in developing monitoring and data systems from inception is critical, as is working with key actors to analyze, interpret and communicate key findings to create demand and investment in data within the system.

RESOURCES

World Bank Capacity Development Toolkit for M&E Systems: http://documents1.worldbank.org/curated/en/708391468331216900/pdf/533030PUB0moni101Official0Use0Only1.pdf

Room to Read on Why Data Matters for Children Learning to Read (video): https://www.roomtoread.org/impact-and-reach/tracking-results/

Ed Data II Summary of 3 Data Capacity Assessments: https://ierc-publicfiles.s3.amazonaws.com/public/resources/Mozambique%20Data%20capacity%20assessment.pdf

Amanda Makulec on "Why No One Is Using Your Dashboard (MERL Tech DC): https://www.slideshare.net/AmandaMakulec/why-no-one-is-using-your-dashboard-113349607

World Bank and UNESCO Framework for Assessing the Quality of Education Statistics: https://unstats.un.org/unsd/dnss/docs-nqaf/WB-UNESCO-DQAF%20for%20education%20statistics.pdf

Data Visualization Society- Collaboration Opportunities and Resources: https://www.datavisualizationsociety.com/resources

Ensure monitoring indicators for unintended consequences and do no harm: https://www.edu-links.org/sites/default/files/media/file/TWB%20Landscape%20Review_June%202019.pdf

Complete Series of Structured Pedagogy How-To Guides: https://scienceofteaching.s3.eu-west-3.amazonaws.com/index.html

AREAS WHERE TECHNICAL EXPERTISE WILL BE NEEDED

Monitoring and evaluation: to determine indicators of implementation fidelity and achievement of outcomes.

Education research and communication: to support tool design, dashboard development, data analysis and reporting/communicationing monitoring, and evaluation findings that are targeted and accessible.

Data Quality Management: to ensure data is collected, stored, accessed and analyzed according to best practice.

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3 The USAID Learning Lab CLA Toolkit is available at https://usaidlearninglab.org/qrg/learning-agenda
4 Demetra Smith Nightingale, Keith Fudge, and Will Schupman, "Evidence Toolkit: Learning Agendas" (Evidence Based Policymaking Collaborative, Washington, DC, March 2018). https://www.urban.org/sites/default/files/publication/97406/evidence_toolkit_learning_agendas_2.pdf

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Structured Pedagogy

GUIDE 8

What do Education Leaders Need to Know?

INTRODUCTION

Improving foundational literacy and numeracy requires changes in day-to-day teaching practice. Structured pedagogy programs have demonstrated impact when they have succeeded in getting teachers to use the desired teaching and learning materials every day, consistently employ class time more productively, and systematically deploy improved instructional methods. What aspects of the education system are most critical to supporting those ingredients for success?

UNDERSTAND THE SYSTEM'S MAIN PRIORITY

It is almost cliché to say that leadership is important, so we will focus on the aspects of education system leadership within a country that are instrumental to improving foundational literacy and numeracy. First, national leaders must state clearly that improved learning outcomes are the ultimate objective of the education system.

The results of assessments can be used to secure a stronger commitment to that objective. For example, one of the main achievements of the USAID Education Data for Decision Making project was the development and systematic use of the Early Grade Reading Assessment and Early Grade Math Assessment. In numerous countries, the results of these assessments were used to generate interest in and attention to early learning. Pratham in India and Uwezo in East Africa have also used assessment results to advocate for improving foundational literacy and numeracy outcomes. Low performance on these kinds of assessments, and extremely low in some cases, act as jolts to education systems. And when leaders in the education sector took seriously the implications of those assessment results, improving early grade learning became a priority objective in their sector strategies and plans.[1]

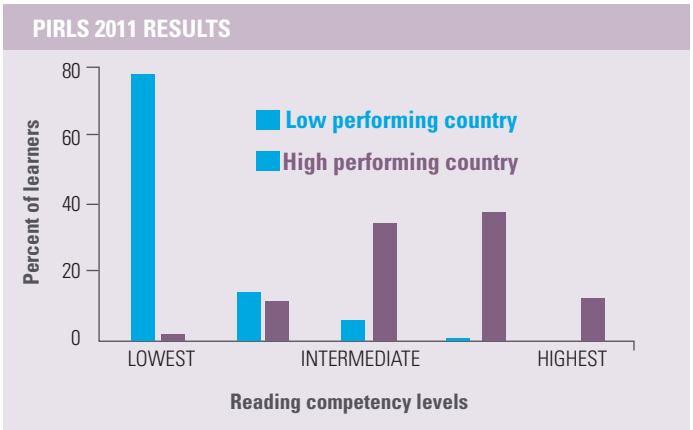
When considering the outcomes of their country's education system, education leaders and other stakeholders often are most concerned about performance on high stakes exams or whether students have access to a more advanced curriculum. Therefore, education sector leadership should understand and then emphasize in its communication the link between success in the foundational years of school and success at achieving better outcomes in upper grades and more advanced subjects. Ministries of finance can be shown the link between better early literacy and numeracy outcomes and cost savings through reduced dropout and improved persistence (using metrics such as learning adjusted years of schooling to show improved educational efficiency).

Education systems can sometimes become focused on improving outcomes for their most advanced students, with stakeholders thinking that is how they get better performance on national exams or international comparative assessments. We need to help education system leaders understand that the exact opposite is true. To counterbalance this tendency, systems should be helped to explicitly prioritize equity. An argument to support an emphasis on equity is that improved overall performance is achieved by bringing up the bottom. As illustrated in the graph shown here, countries with a much greater share of students who attain the lowest reading

NATIONAL LEADERS MUST STATE CLEARLY THAT IMPROVED LEARNING OUTCOMES ARE THE ULTIMATE OBJECTIVE OF THE EDUCATION SYSTEM

proficiency level on an international assessment have the lowest overall assessment outcomes. Higher performing countries are those that have reduced the share of students scoring in the lowest level, while increasing substantially the proportion of those in the intermediate levels. Moving students out of the lowest levels of proficiency not only helps overall system performance, but reduces inequities and helps more fully realize a country's human potential.

Furthermore, systems need to make sure that typically disadvantaged populations are not overlooked. Data should reflect the extent to which implementation is not only reaching but is appropriately adapted to the challenges faced in neglected areas of a country. Of particular concern is assuring that efforts reach communities impacted by conflict or crisis.



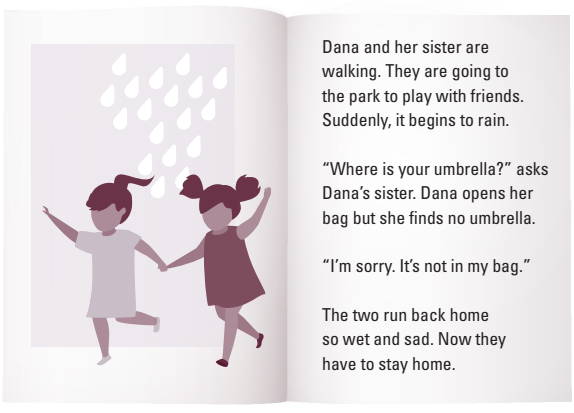
COMMUNICATE EXPECTATIONS

When leadership has committed to improving learning outcomes as a priority goal. And when they have targeted foundational learning as a critical facet of that, it is imperative to define student outcomes in terms that can be understood by the broad spectrum of stakeholders. **Making such information available in curriculum documents or ministry policy papers is not enough, however. Rather, we advise ministries to publish specific goals in public forums and media and to show, for example, a paragraph of text that students should read fluently or examples of the math operations they should perform automatically**.

For example, Prime Minister Modi of India publicly announced in September 2020, "The journey from 'learn to read' to 'read to learn' can only be completed through foundational literacy and numeracy," then added, "We have to ensure that all children who have passed Class 3 should read 30 to 35 words in a minute."[3]

Expectations regarding what students should be able to do make up only a piece of the overall puzzle. **Education leadership must also explicitly define what actors in the system are expected to do to achieve those student outcomes**. This includes expectations for teachers obviously, but also for how staff throughout the system provide the resources, materials, training, and support that teachers need to succeed.

Expectations for teachers must align with what research shows improves outcomes: the curriculum scope and sequence teachers should be following, the materials they should be using, the amount of class time they should be spending on foundational literacy and numeracy, and the instructional methods and assessments they should be regularly employing. All of which should be realistic within the given operating environment of schools (e.g., see textbox).[4] **Professional norms or standards for those teaching in the early grades can enumarate such expectations, but this is not just a question of definition. Of even greater importance is communicating those expectations through mutliple, mutually reinforcing channels (e.g., official ministry communiques, union or professional association newsletters, public service announcements, newspaper articles, website postings, etc.)**.. Training and support activities should be designed around helping teachers learn how to fulfill these expectations. And school heads and other decentralized administrative staff should repeatedly convey these same expectations to



Example of an English text that a grade 3 student in the Philippines should read fluently and understand

teachers. Using the full range of media and social media channels currently available is strongly recommended, if not required, if expectations for teachers are going to be widely known, understood, and applied.

If students and teachers are being asked to meet new expectations for learning and teaching, then the education system also has to establish clear expectations for the supports they will receive. The minimum package of materials, the amount of training and professional support provided to each teacher, should be clearly defined and communicated broadly. Everyone—teachers, administrators, parents—should know what to expect and should be able to say whether their school received the required inputs and supports.

Data on teacher adherence to the structured sequence of lessons and on system provision of the desired package of inputs are indicators of whether the preconditions for improving outcomes are being assembled systematically across the education system. School heads and districts should collect and review such information throughout the school year.

REALISTIC EXPECTATIONS

Education system expectations should be ambitious, yet realistic. Is the curriculum too broad? Is enough time allocated for foundational literacy and numeracy? Furthermore, does allocated time translate into actual opportunities for students to learn? How much time is lost to teacher absence, school closure, or poor management of the school day? A mismatch between an ambitious curriculum and the effective opportunity to learn offered in school negatively impacts learning outcomes.

MANAGEMENT DOWN THE SYSTEM

As important as the central ministries are, the district and subdistrict levels, that connect most directly with schools, are essential as well. **Actors at these levels are important links in the communication chain needed to help schools, teachers, and communities understand the new expectations mentioned above. Not all communications should go through the bureaucracy, but these internal actors should be reinforcing the expectations in all their interactions with schools**.

Teachers, school heads, and local administrators do need to gain specific knowledge and understand the instructional methods aimed at improving foundational literacy and numeracy (and teachers need to practice those methods). Training can provide that, but what training alone does not address is the normative environment within which teachers, school heads, and administrators will apply that knowledge and skill. The social and institutional context within which they live and work must inform a new set of norms (expectations) related to their comportment and practice. This requires taking time to understand the social and organizational context and to identify sources of "friction" (as described by Dan Ariely, James B. Duke Professor of psychology and behavioral economics at Duke University). that work against teachers' adopting new behaviors. **We have to make it as easy as possible for teachers to adopt and sustain new teaching methods**.

All this requires multiple, multi-channel efforts to gather information and then influence knowledge, attitudes, and beliefs at the local level. **Behavior change and social behavior change techniques, and the lessons from behavioral economics, should be called on**. For example, conduct research into teachers' pre-existing beliefs and behaviors, and into the prevailing norms among teachers related to instructional practice. Target messages based on those findings and engage influential actors in communicating those messages to teachers. Make changed behavior easier to take up and nudge and support teachers as they try out new techniques.

In addition, district and subdistrict personnel and school heads should direct their efforts to supporting the delivery of the instructional core. Luis Crouch refers to this as tight management—management focused on a specific, limited number of priorities—to ensure teachers buy into the structured pedagogy approach.[5] Low-performing systems improve when they manage to and deliver on implementing that approach.

Teacher observations and feedback should be designed to reinforce use of the materials and deployment of the desired instructional methods. Fast feedback loops are essential. School heads and district or subdistrict personnel should observe lessons just after teachers receive training to reinforce the approach and learn where teachers may be struggling. Waiting until the end of the year to conduct an evaluation wastes precious opportunity to reinforce, encourage, learn, and iterate to improve. It should be made explicit that conducting such observations is an expectation for these staff.

MULTIPLE, MULTICHANNEL EFFORTS ARE REQUIRED TO GATHER INFORMATION AND INFLUENCE KNOWLEDGE, ATTITUDES, AND BELIEFS AT THE LOCAL LEVEL

MONITORING, INTERVENING, AND ACCOUNTABILITY

In Guide 7, on data and accountability we discuss data that are useful for monitoring the implementation and impact of structured pedagogy approaches. Here we add to the advice of that guide by **stressing the value of monitoring as a means to reinforce the changed normative environment and expectations for teachers and schools**. Most systems use school visits by district or subdistrict personnel to conduct inspections or to verify administrative compliance. Too often such inspections draw attention away from teaching and learning and end up reinforcing the wrong things. **Visits to schools should focus explicitly (if not exclusively) on teaching and learning and, in doing so, demonstrate that these are the priorities of the education system**. Pritchett refers to this as aligning the education system for learning—meaning administrative and managerial requirements should be aligned to improving learning outcomes.[6]

Even if administrative personnel are not pedagogical experts, the mere fact that they observe a lesson and look for a few key features of the structured pedagogy approach signals expectations to the teacher. Feedback to teachers on those few key aspects of their instruction again reinforces the expected new practices.

In Jordan, data collected at the school level informs decisions about which teachers should get a more intensive level of coaching and which teachers require less.

Besides serving to reinforce expectations, collecting the data referred to in Guide 7 also provides the basis for identifying schools that may be struggling. Such information is vital, provided the system is prepared to respond and support those who need extra help. Thus, systems should create forums where officials can review school-level data and make decisions about where to target additional resources. Too often resources are distributed based on a philosophy of "fairness" defined as each district or school getting an equal allocation. Effort must be directed toward showing education system actors that equal distribution is often actually inequitable. After ensuring the basic allocation of resources to all schools, to promote equity the system could target additional training, additional support visits, or extra resources to help overcome disadvantages in some communities as needs are identified.

Some key features of structured pedagogy, easily observed and reinforced:

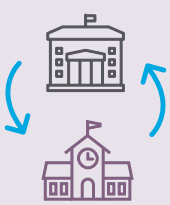
1. Can the teacher explain the objectives of her lesson? Can she state the goals for her students for the year?
2. Does the teacher instruct students to take out their books and open to the appropriate page?
3. Is the teacher referring to her teacher's guide throughout the lesson?
4. Are the students engaged in activities throughout the lesson period?
5. Was there time in the lesson for students to practice the learned skill individually?
6. Do teacher and student materials show obvious signs of use?

Finally, monitoring performance at the school level is also essential to establish accountability. The extent to which monitoring communicates and reinforces changed expectations, it also contributes to accountability within an evolving organizational normative environment. Accountability at each level—for teachers, school heads, and subdistrict and district personnel—must be aligned.[7] **If teachers are accountable for specific instructional practices and the learning outcomes of their students, then everyone else must share that accountability and be accountable for providing the support schools and teachers need**.

Education systems lack this kind of shared and two-way accountability. **In addition to tracking outcomes and the provision of resources, we recommend helping establish mechanisms through which schools and their communities can report on and hold the system to account for providing needed inputs and teacher training and support**.

PROVIDE ADDITIONAL SUPPORT BASED ON SCHOOL-LEVEL NEEDS

TWO-WAY ACCOUNTABILITY



System accountable for:
- Supports schools need to succeed
- Learning outcomes

Schools accountable for:
- Learning outcomes
- Implementing structured pedagogy

CONCLUSION

A theme that runs through this "How-To Guide" is the need for education systems to have robust two-way communication conveying expectations and hearing back about fulfillment of those expectations. Many systems will establish strong policy frameworks and strategies and plans, and recently many of those plans have recognized the need to accord priority to improving foundational literacy and numeracy. Ministries must do a much better job translating their commitment to improving learning into clear expectations for actors throughout the system. They must make use of a variety of communication resources, channels, and media to repeatedly convey those expectations to all concerned and for all concerned to monitor and be held to account for fulfilling those expectations. Ultimately, administrators and managers must be accountable for providing the sustained support and resources teachers and students need.

About the symbols in this guide:

Indicates "Red Alert": Something to be aware of and alert to, because it is a common problem

Indicates "Non-negotiable": a must-have

RESOURCES

Lant Pritchett on learning as a priority (5-minute video): https://www.youtube.com/watch?v=wUehLnWdtxQ

Luis Crouch's RISE blog on three cases of system alignment: https://riseprogramme.org/publications/systems-implications-core-instructional-support-lessons-sobral-brazil-puebla-mexico

Schuh Moore, DeStefano and Adelman on opportunity to learn: https://www.epdc.org/sites/default/files/documents/EQUIP2%20OTL%20Book.pdf

Lant Pritchett and Amanda Beatty on overambitious curriculum: https://www.cgdev.org/publication/negative-consequences-overambitious-curricula-developing-countries-working-paper-293

Dan Ariely on Behavioral economics (TED talk): https://www.ted.com/talks/dan_ariely_how_to_change_your_behavior_for_the_better?language=en

Brookings Institute on social accountability: https://www.brookings.edu/blog/education-plus-development/2016/12/21/from-data-to-learning-the-role-of-social-accountability-in-education-systems/

Complete Series of Structured Pedagogy How-To Guides: https://scienceofteaching.s3.eu-west-3.amazonaws.com/index.html

AREAS WHERE TECHNICAL EXPERTISE WILL BE NEEDED

Pedagogy: to identify a limited set of "signal" aspects of instructional change so that observers of teaching practice know what to focus on when monitoring teachers and what must be communicated as "the new normal."

Behavioral economics: to design approaches to influencing teacher and administrator behavior that take into account the realities of human decision-making, incorporating such concepts as the overconfidence effect, temporal discounting, loss aversion, anchoring and framing, and social norms.

Behavior change communications: to design surveys that provide insight into the knowledge, attitudes, perceptions, and prevailing social norms that influence people's existing behaviors, and based on those findings, design multichannel strategies for promoting behavior change.

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2 Data are from the 2011 Progress in International Reading Literacy Study (PIRLS).

3 The Indian Express News Service, "Mark Sheets Turned into Prestige Sheet for Parents, Pressure Sheet for Children," The Indian Express (New Delhi), September 11, 2020, online edition. https://indianexpress.com/article/education/mark-sheets-turned-into-prestige-sheet-for-parents-pressure-sheet-for-children-pm-6591811/

4 On opportunity to learn, see Audrey-Marie Schuh Moore, Joseph DeStefano, and Elizabeth Adelman, "Opportunity to Learn: A High Impact Strategy for Improving Educational Outcomes in Developing Countries," EQUIP2: Educational Policy, Systems Development and Management, U.S. Agency for International Development report, FHI 360, Washington, DC, March 2012. https://www.globalreadingnetwork.net/resources/opportunity-learn-high-impact-strategy-improving-educational-outcomes-developing?q=eddata/opportunity-learn-high-impact-strategy-improving-educational-outcomes-developing-countries . On the limitations of overly ambitious curriculum see Lant Pritchett and Amanda Beatty, "The Negative Consequences of Overambitious Curricula in Development Countries," Center for Global Development (CGD), Working Paper 293, CGD, Washington, DC, April 2012. https://www.cgdev.org/publication/negative-consequences-overambitious-curricula-developing-countries-working-paper-293.

5 See Luis Crouch's blog on the Research on Improving Systems of Education (RISE) programme's website: https://riseprogramme.org/publications/systems-implications-core-instructional-support-lessons-sobral-brazil-puebla-mexico

6 Lant Pritchett, "Creating Education Systems Coherent for Learning Outcomes: Making the Transition from Schooling to Learning," RISE Programme Working Paper 15/005, RISE Programme, Oxford, UK, December 2015. https://riseprogramme.org/publications/creating-education-systems-coherent-learning-outcomes

7 Benjamin Piper, Joseph DeStefano, Esther M. Kinyanjui, and Salome Ong'ele, "Scaling Up Successfully: Lessons from Kenya's Tusome National Literacy Program," Journal for Educational Change 19, (2018): 293–321. https://doi.org/10.1007/s10833-018-9325-4

8 Ibid; Pritchett, Creating Education Systems, 2015.

Guide authored by **Joseph DeStefano**

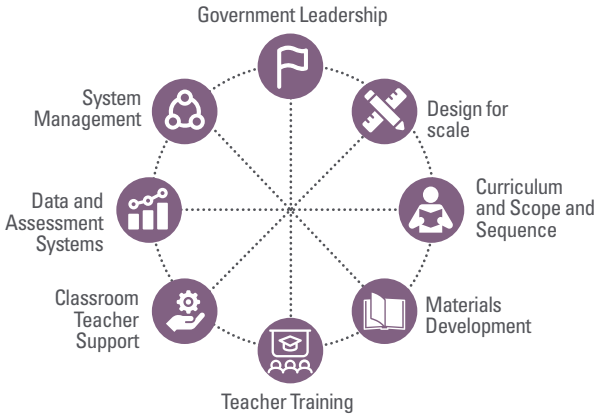
Structured Pedagogy Can Really Work

A Note for Education Leaders

Having your country be recognized as a high-performing education system requires focusing on improving learning outcomes. Early primary education is when a strong foundation is laid for future learning. Failing to build that foundation means that learners will struggle to pass their end-of-primary examinations and move on to higher levels of education. Indeed, an individual's development of higher-order thinking skills and achievement of lifelong success depends on strong literacy and numeracy skills developed during early grades.[1]

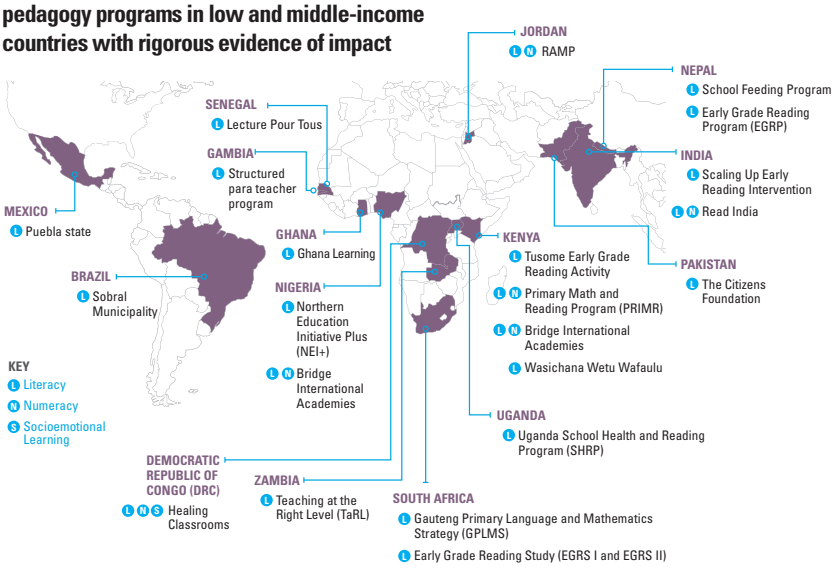
The disruption to schooling in 2020 caused by the COVID-19 pandemic has deprived many young learners of the structured instruction they need to develop basic skills. The extended periods of school closure may lead to a year or more of learning being lost.[2] Deploying evidence-based approaches to rapidly improve foundational learning outcomes is, therefore now more important than ever. Doing so will give you an opportunity not only to recoup this past year of lost learning but to potentially build an education system that is stronger and better able to increase learning outcomes moving forward.

Investments for Successful Structured Pedagogy Programs



Structured pedagogy is a coordinated instructional improvement approach that includes lesson plans for teachers, student textbooks, teacher training focused on skills and ongoing teacher support, often including coaching. Structured pedagogy programs have a coherent package of investments, specifically designed for your context, that work together to improve classroom teaching and learning outcomes (see Figure 1). Such structured pedagogy programs have consistently been able to improve early grade learning across the world, in many differing contexts. Students in the Tusome structured pedagogy program learned about two years' worth of skills in English and Kiswahili in one year, and children in the SERI program in India learned two and a half years of skills in just one year. Systematically implementing structured pedagogy not only leads to large impacts on literacy and numeracy levels in early grades but can also lead to fewer dropouts, increased promotion, higher exam scores, greater teacher satisfaction, and better outcomes in later years of schooling. Figure 2 depicts where effective large-scale structured pedagogy programs have been implemented effectively. It indicates the country; the name of the program; and whether the program supports literacy, numeracy or socio-emotional learning areas.

FIGURE 2. Recent, large-scale, structured pedagogy programs in low and middle-income countries with rigorous evidence of impact



What does it take to effectively implement a structured pedagogy approach at scale?

It takes focus

Improved learning outcomes are achieved through better teaching. A **focus on classroom instruction and on pedagogical quality needs to be stated, communicated, and reinforced throughout the education system**. Too often, improvement strategies focus only on inputs such as building schools and providing textbooks. But what teachers do with those inputs matters much more. Making explicit the teaching techniques teachers should use in the classroom that are proven to work and supporting them through mutually reinforcing channels is critical. This includes better training, more effective and cheaper book purchase and distribution, more focused coaching and teacher support, and higher expectations. The focus that comes from you and other national education leaders is the key ingredient.

It takes integrated materials

To help make it easier for teachers to adopt effective instructional methods, you need to design teaching materials based on a coherent sequence of easy-to-follow lessons.[4] Those lessons need to provide numerous activities and exercises that allow students to practice and refine their basic skills. Meanwhile, student materials should be engaging and appropriate to grade level. Finally, and most importantly, teacher lessons and student materials need to be closely aligned with each other to simplify the teaching task.

It takes changes in teacher behavior

Improvements in national-level outcomes will occur only if tens of thousands of teachers apply the structured pedagogy approaches on a day-to-day basis in their classrooms. Changed teacher behavior is more than a matter of having the required skills—it also means changing teachers' attitudes and expectations regarding what it means to be a good teacher. In the context of structured pedagogy, this means understanding the lessons in the teachers' guides, implementing them daily in classrooms, and using one's expertise to improve the quality of instruction. These behavioral factors need to be addressed as much as, if not more than, teacher skills or qualifications. Doing so requires using the research and techniques of behavior change science—understanding perceptions, norms, and beliefs and designing communications and support interventions based on how these elements need to change Over time, as teachers become familiar and skilled with the structured pedagogy methods, they will need less direction and should be supported to adapt and modify their pedagogical repertoire.

It takes a commitment to an aligned system of training, coaching, and follow-up

One-off trainings do not produce long-lasting teacher behavior change. **Teachers must be trained, of course, but they also need to be continually supported and monitored as they apply structured pedagogy methods in their classrooms**. Teacher support therefore needs to turn away from business as usual. Indeed, resources spent on training without systematic classroom-based follow-up and support are essentially wasted. It may cost more to establish regular follow-up and support structures, but the returns will be substantially greater in terms of teacher instructional change and, as a result, improved learning outcomes. Such a system of teacher support can also be used to improve teaching in other learning areas and at higher levels in the education system.

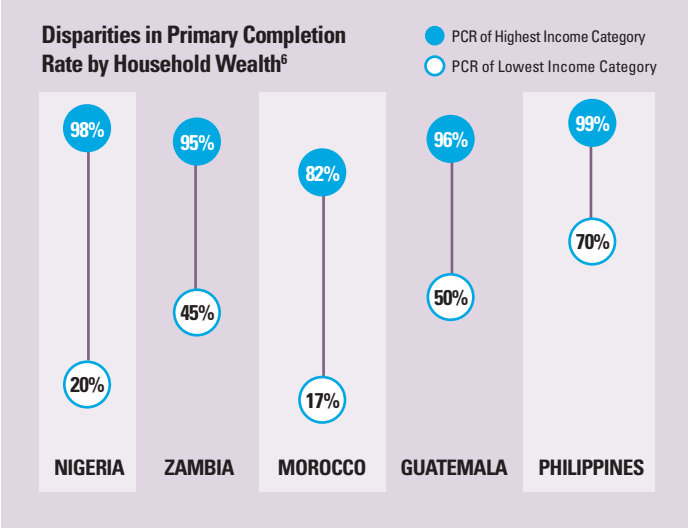
It takes concerted implementation effort

SENIOR EDUCATION LEADERS IN SOBRAL, BRAZIL, USED STRUCTURED PEDAGOGY METHODS TO MOVE FROM 1366TH PLACE IN THE COUNTRY TO 1ST PLACE, DESPITE THE CITY'S HIGH POVERTY LEVELS. KEY TO THE LEADERS' SUCCESS WAS SETTING CLEAR GOALS AND TARGETS AND HOLDING THE SYSTEM ACCOUNTABLE FOR MEETING THEM.

Your education system, like most, likely has a well-thought-out sector plan covering the full range of priorities for improvement and investment. Achieving the outcomes of such a plan requires implementation capacity—and this is often where efforts run aground. Trying to implement complex reforms across all educational levels and concerns is daunting for even the best-functioning systems. Research on high-performing education systems points to the importance of middle levels of management. **Tight management across the system is essential, and sustained attention needs to be focused on a small number of specific priorities. For structured pedagogy, these key priorities are instructional practice, the daily use of materials, and a teacher support system**. These priority activities need to be sustained long enough for teachers to fully adopt the desired practices and begin to see the results of their efforts. Rapid monitoring of teacher uptake and student outcomes helps uncover evidence of effectiveness, which can be used to reinforce and re-emphasize the desired change.[5]

It takes additional effort to overcome disadvantage and inequity

All education systems are challenged to address the inequities and disadvantages that are prevalent in society at large. When implementing structured pedagogy, you should recognize that some school communities will inevitably struggle more than others to improve. As a first step, it is critical to identify such districts and schools and offer them targeted additional help. **For example, school support officers can visit struggling schools more frequently; head teachers can observe and advise struggling teachers more regularly; and additional training can be organized for teachers who need further skill reinforcement**. The package of support for disadvantaged parts of the country should be designed and prepared ahead of time and then applied where needs are revealed to be greatest.



The Bigger Picture

You may be asking, "But if I put all my energy into implementing structured pedagogy to improve foundational skills, how does that benefit the rest of the primary cycle, to say nothing of other levels of education?" Improved literacy and numeracy outcomes help learners succeed in other subjects, and a more effective school support system can be used to improve the quality of the entire system. Your system's capacity to design high-quality materials, to distribute them cheaply throughout the country, to focus on improving teaching, and to directly support teachers and schools can be capitalized on to the benefit of other subjects and grade levels (see text box on previous page). **Demonstrating rapid improvement in foundation skills and then applying that acquired capacity to the rest of the system would garner broad public support and make your system a model for other countries**. Brazil, Mexico, and Kenya have recently been touted as examples of how structured pedagogy programs can effectively support the education system more broadly.[7]

Questions for Your Partners

Structured pedagogy has shown substantial effects and has been identified by the World Bank and the UK's Foreign, Commonwealth Development Office as one of the "Smart Buys" for improving learning in low- and middle-income countries.[8] Education leaders are faced not only with the complex task of managing their system, as described above, but also with working with development partners to implement effective structured pedagogy programs. In this regard, you are no doubt well aware that not all partners are the same. The list below contains questions you can ask to make sure that potential partners offer what is best for your country:

1. We face constrained resources due to COVID-19. Why should structured pedagogy be a priority when resources are limited?
2. While I understand that it may take additional resources to effectively implement structured pedagogy, can you show evidence of the cost-effectiveness of your proposed approach?
3. What if our teachers resist such a structured approach? How will the program be made acceptable to them? What is in it for them?
4. How much and what kind of capacity building will ensure that our lower primary literacy and numeracy system can be effective beyond the duration of donor support? What will enable us to build on our success in lower primary to improve other levels of our system?
5. How will this program make use of the resources I already have?
6. Who can I talk to who has run this type of program before?

THE WAY FORWARD

We recommend carefully analyzing partners' responses to these questions as you consider implementing a structured pedagogy program. While such programs have shown significant results at the regional and, in some cases, national levels, their impact depends heavily on the quality of implementation and their meaningful integration into the education system. We also encourage you to have senior leaders review the structured pedagogy guidance on key elements of implementation (see links below) so that relevant lessons can be applied to your country's unique context. With a focus on outcomes and with clear direction from the top, it is possible to improve the quality of education in ways that support the entire education system and contribute to improved learning outcomes.

RESOURCES

Complete Series of Structured Pedagogy How-To Guides: https://scienceofteaching.s3.eu-west-3.amazonaws.com/index.html

Indian Prime Minister Narendra Modi on the country's increased focus on foundational literacy and numeracy: https://www.youtube.com/watch?v=Y9JA7VK0e8o&feature=youtu.be&ab_channel=CentralSquareFoundation

Lant Pritchett on learning as a priority (5-minute video): https://www.youtube.com/watch?v=wUehLnWdtxQ

Luis Crouch on three cases of system alignment: https://riseprogramme.org/publications/systems-implications-core-instructional-support-lessons-sobral-brazil-puebla-mexico

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8 Global Education Evidence Advisory Panel, Cost-Effective Approaches, 2020.

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