



**CENTRAL SQUARE  
FOUNDATION**



**ASHOKA  
UNIVERSITY**



**Centre for  
Social and  
Behaviour  
Change**

# Improving Teacher Uptake of Effective FLN Instruction

**Intervention Design Report**

August, 2023



## List of Acronyms

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All	Assessment Informed Instruction
ARP	Academic Resource Person
BEO	Block Education Officer
CFU	Checking for Understanding
CSBC	Centre for Social and Behaviour Change
CSF	Central Square Foundation
EAST	Easy, Attractive, Social, Timely
FLN	Foundational Literacy and Numeracy
GRR	Gradual Release of Responsibility
IDI	In-depth Interview
KSG	Key Stakeholder Group
LP	Lesson Plan
MPV	Micro-Practice Videos
NIPUN	National Initiative for Proficiency in reading with Understanding and Numeracy
PDIA	Problem Driven Iterative Adaptation
SL	School Leader
TG	Teacher Guide
TLM	Teaching and Learning Material
UP	Uttar Pradesh

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## Executive Summary

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Providing quality education to all children in order for them to acquire foundational skills and achieving the goals set out by the NIPUN Bharat Mission have become a national priority. However, despite the important role of teachers as primary agents to improve learning outcomes, their uptake of the features of the NIPUN Mission remains low. Through a rigorous diagnostic exercise jointly undertaken by Central Square Foundation and the Centre for Social and Behaviour Change, a long-list of behavioral and mindset barriers were identified that inhibit teachers from effectively adopting the program.

The team has designed behavioral interventions aimed at improving teacher uptake of effective teaching practices, which will be deployed and tested on-field. The impact of the interventions will be rigorously evaluated and the interventions will then be scaled based on insights gained. The purpose of this report is to provide a detailed account of the development process and design details of the interventions.

As a first step, barriers were prioritized using a 4A (authority, acceptance, ability, affect) framework. Simultaneously, the team worked on refining the target behaviors based on the diagnostic findings and arrived at five specific teacher practices that the interventions would target. The target behaviors centered around increasing adoption of the teacher guide and key pedagogical practices identified during the diagnostic phase. The intervention design process was kickstarted with an ideation workshop, followed by reviewing and categorizing the ideas that arose from the process and then combining viable ideas to create a first version of treatment arms. This was followed by low-fidelity prototyping of select intervention components from these treatment arms, which were user-tested on field with a small sample of teachers to gather their feedback on the components' viability, acceptability, and relevance, as well as on potential deployment mechanisms.

Based on the insights from prototyping, the treatment arms were refined and finalized. Once the various intervention components were moved to the development stage, first cuts of each developed component were prototyped with a group of teachers and teacher mentors. The final treatment arms are summarized in the table below.

**Table A: Treatment Arm 1 - Chatbot**

<b>Component</b>	<b>Description</b>
Chat Bot	<ul style="list-style-type: none"><li>● Textual summary and audio notes for lesson plans for each day and week of the literacy and numeracy teacher guides</li><li>● Reminders for teachers to access the chatbot for lesson planning</li><li>● Rewards to encourage sustained engagement and usage of the chatbot</li></ul>
<b>Deployment</b>	Whatsapp Chatbot


**Table B: Treatment Arm 2 - Micro-Practice Videos**

<b>Component</b>	<b>Description</b>
Micro-practice videos	<ul style="list-style-type: none"><li>● Short videos based on demonstrating key pedagogical practices</li></ul>
Teacher testimonial videos	<ul style="list-style-type: none"><li>● Videos of experienced teacher talking about using focus micro-practice</li></ul>
Reminders	<ul style="list-style-type: none"><li>● Reminders to encourage engagement with videos</li></ul>
Rewards and Recognition	<ul style="list-style-type: none"><li>● Rewards and recognition to encourage sustained engagement with videos and implementation of micro-practices</li></ul>
<b>Deployment</b>	Whatsapp groups



# Chapter 1

## Overview



India is in the midst of a foundational learning crisis, which requires bottom-up solutions that include and involve all stakeholders in the education ecosystem, as opposed to top-down policies or mere increments in national education expenditure<sup>1</sup>. Teachers are amongst the key stakeholders in education reform, and must be effectively engaged to truly improve Foundational Literacy and Numeracy (FLN) outcomes at scale, as envisioned in India's FLN Mission, NIPUN Bharat.

The NIPUN Bharat Mission was launched by the Government of India in 2021 with the vision of creating an enabling environment to ensure universal foundational literacy and numeracy by 2026-27, with every child acquiring the necessary competencies in reading, writing and numeracy by the end of grade 3, and no later than grade 5<sup>2</sup>.

Under the NIPUN Mission, teachers have been provided with the requisite training as well as teaching and learning material needed to transact the curriculum outlined in the Mission. However, teacher adoption still remains low<sup>3</sup>. Potential reasons for this low adoption include challenges in securing buy-in for the program as well as maintaining momentum and motivation since the impact of educational reforms is only evidenced in the long-term. Further, new programs are often iterative in nature, overwhelming teachers with frequent changes and leaving them reluctant to adopt the programs. Reasons for low uptake may thus include lack of motivation, lack of ability to convert intent into action, and other behavioral biases impacting teacher perception of choices available to them. Therefore, a behavioral lens becomes increasingly crucial to investigate the problem and design and evaluate behavioral solutions to improve teacher adoption of the program, and consequently, foundational learning outcomes .

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<sup>1</sup> [Muralidharan and Singh \(2021\), "India's New National Education Policy: Evidence and Challenges", Rise Programme](#)

<sup>2</sup> [Press Information Bureau, NIPUN Bharat](#)

<sup>3</sup> Central Square Foundation, Systemic Drivers of Foundational Learning Outcomes, 2021



Centre for Social and Behaviour Change and Central Square Foundation are collaborating on identifying, designing and evaluating scalable and effective behavior change interventions for teachers that can support improvement in FLN outcomes. The main objectives of the project are:

1. To understand the barriers (mindsets, attitudes and behaviors) of teachers and coaches that impact classroom instructional practices and FLN outcomes.
2. To design, test and scale behavioral interventions to improve teacher uptake of effective instructional practices.

In order to understand the barriers to adoption of effective practices for teachers and teacher coaches, the project team undertook an exploratory and qualitative diagnostic research study in 3 districts of Uttar Pradesh - Sitapur, Hardoi and Barabanki. This diagnostic spanned 3 months and was conducted in two phases. Phase 1 of the diagnostic study focused on understanding mindset, beliefs, social support system, and other key behavioral drivers for teachers and ARPs, and the second phase focused on gaining an in-depth understanding of actual classroom practices, perception of material and tools provided under the FLN program, and garnering the insights of other stakeholders (School Leaders, Block Education Officers, Civil Society Organisations etc.) in the ecosystem. Findings across different modes of data collection (IDIs, classroom observations, stakeholder consultations and user perception survey) were triangulated and analyzed to arrive at a long-list of behavioral and systemic barriers affecting adoption of effective pedagogical practices. A detailed report on the diagnostic study can be found [here](#).

The subsequent phase of the project involved designing behavioral interventions to promote the adoption of effective instructional practices by teachers. These interventions will be tested and expanded based on the insights gained. This report provides an elaborate account of the intervention design process. Chapter 2 outlines the prioritization of barriers. Chapter 3 explains how insights from the diagnostic phase were utilized to refine the target behaviors. The prioritized barriers and revised target behaviors were then used to design interventions, which were tested in the field with teachers. Chapter 4 provides details about the development of the initial version of the intervention concepts. Chapter 5 discusses the low-fidelity prototyping approach and the resulting insights. Chapters 6 and 7 offer a detailed description of the two final intervention treatment approaches, highlighting their distinct elements and design principles. Chapter 8 provides an overview of the plans for deployment and evaluation. The report concludes by outlining the next steps for the project.



# Chapter 2

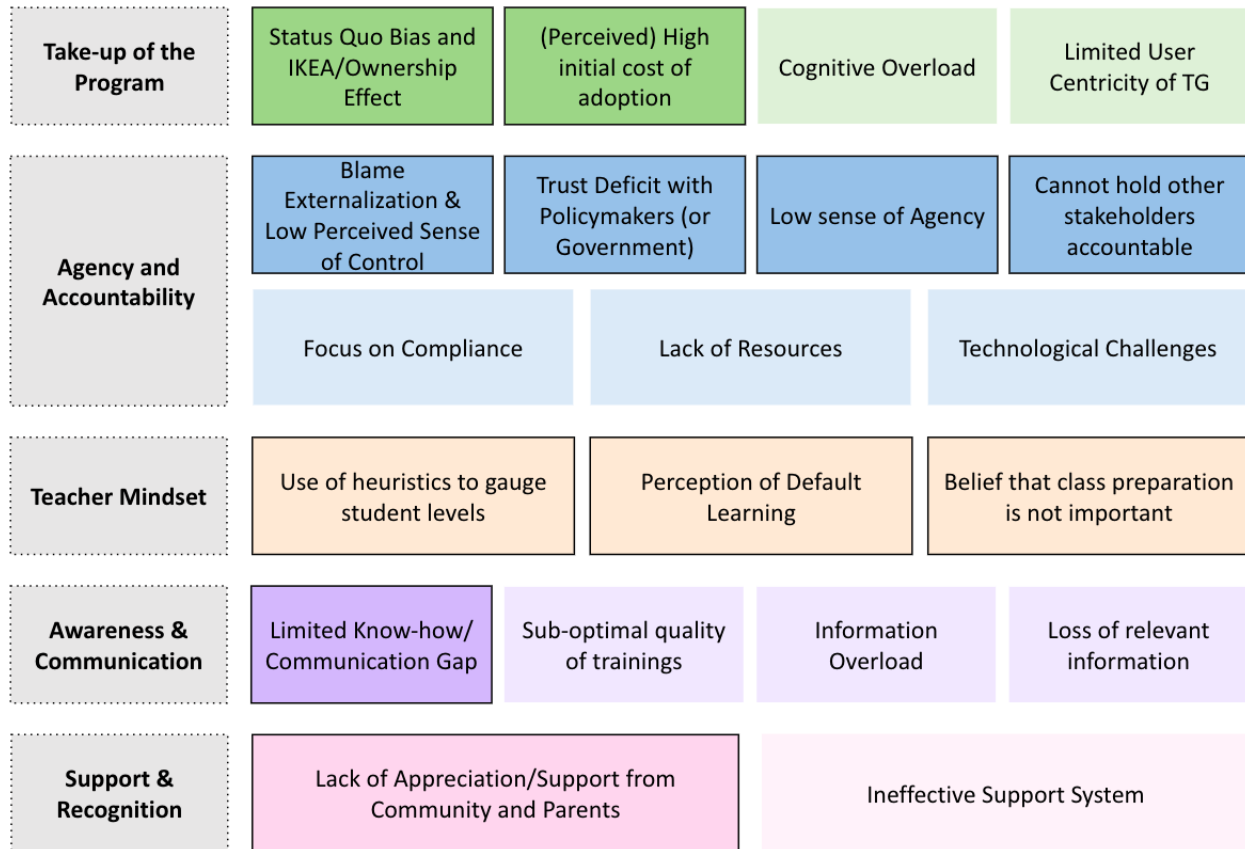
## Barrier Prioritisation



A rigorous diagnostic study comprising interactions and interviews with teachers and ARPs, and classroom observations was conducted over a period of three months across three districts. The study revealed an exhaustive list of behavioral and systemic barriers affecting teacher adoption of effective pedagogical practices.

### 2.1 Summary of Barriers

The figure below summarizes a thematic representation of identified barriers. Outlined boxes with darker shades in each theme denote behavioral barriers, whereas the lighter shades denote systemic barriers.



**Figure 1: Thematic Representation of Identified Behavioral and Systemic Barriers**

In the process of moving from barriers to interventions, the next step was to arrive at a list of prioritized barriers. With the understanding that interventions could not address all discovered barriers (given the scope of the project and feasibility constraints), prioritizing barriers would allow for targeted interventions with the best chance of shifting teacher behavior.

## 2.2 Barrier Prioritisation Framework

The project team used the Problem Driven Iterative Adaptation (PDIA) approach, which postulates a triple-A framework to analyze the available space for change with each cause of a problem where “the change space is contingent on contextual factors commonly found to influence policy and reform success, shaping what and how much one can do in any policy or reform initiative at any time.”<sup>4</sup> The three factors in the triple-A change space analysis are

<sup>4</sup> PDIAtoolkit, A DIY Approach to Solving Complex Problems, Harvard University (2018)

Authority, Acceptance and Ability. Normally used to assess space for policy reform, the framework was adjusted slightly for the task at hand.

- **Authority** pertains to the consideration of whether shifting a particular barrier is within our locus of control, and whether we have the authority to shift it.
- **Acceptance** is the consideration of how much acceptance (as opposed to resistance) would be found from the target group while shifting a particular barrier.
- **Ability** is the consideration of whether we possess the capacity, in terms of expertise and resources, to shift a particular barrier.

To this a fourth factor of 'Affect' was added to capture the scope for impact from targeting a particular barrier, adapted from the intervention selection criteria (*Potential Impact*) in the EAST Toolkit.<sup>5</sup>

- **Affect** is the consideration of the degree to which target behaviors would shift by focusing on a particular barrier.

### 2.3 Barrier Prioritisation

The project team used this 4A framework to assess the longlist of barriers to arrive at prioritized barriers that the interventions would be designed to address. The barriers were ranked as high, moderate, or low on each of the criteria within the framework. The ranking is detailed in the table below.

**Table 1: Barrier Assessment**

Barrier	Authority	Acceptance	Ability	Affect	Rating	Note
Status-Quo Bias & IKEA/Ownership Effect	Moderate	Moderate	High	High	10	

<sup>5</sup> Target, Explore, Solution, Trial, Scale: An introduction to running simple behavioral insights projects (2022)

<b>(Perceived) High initial cost of adoption</b>	Moderate	Moderate	Moderate	Moderate	8	
<b>Cognitive Overload</b>	Low	High	High	High	10	
<b>Limited User-centricity of TG</b>	Low	High	High	High	10	
<b>Blame externalization &amp; Low perceived sense of control towards problem or outcome of actions</b>	Moderate	Low	Moderate	High	8	
Trust Deficit with Policymakers	Low	Moderate	Low	Moderate	6	Both ability and authority are low
<b>Low Sense of Agency</b>	Low	Moderate	Moderate	Moderate	8	
Cannot Hold Other Stakeholders Accountable	Low	High	Low	Moderate	7	Both ability and authority are low
<b>Focus on Compliance</b>	Low	High	Moderate	Moderate	8	

Lack of resources	Low	High	Low	Moderate	7	Both ability and authority are low
<b>Technological Challenges</b>	Low	Moderate	Moderate	Moderate	7	
Use of heuristics to gauge student levels	Moderate	Low	High	High	9	Classroom Instruction team advised this is a more difficult practice and best to try later
Perception of Default Learning	Moderate	Low	Moderate	High	8	While perceptions are possible to change, we were not able to add this as a part of our intervention package
<b>Belief that class preparation is not important</b>	Moderate	Low	Moderate	High	7	
<b>Limited know-how/ Communication Gap</b>	Moderate	Moderate	High	High	10	
<b>Sub-optimal quality of training</b>	Low	Moderate	High	High	9	
<b>Information Overload</b>	Low	Moderate	Moderate	Moderate	7	

<b>Loss of relevant information</b>	Low	Moderate	High	Moderate	9	
Lack of Appreciation /Support from Community and Parents	Low	High	Moderate	Moderate	8	While parent-teacher relations are important, we were not able to add this as a part of our intervention package
Ineffective Support System	Low	Moderate	Moderate	Moderate	6	Both ability and authority are low

The team arrived at nine prioritized barriers (highlighted in orange) after this rigorous exercise. However, it should be noted that the interventions are not explicitly mapped to the barriers and while we have prioritized certain barriers, interventions address multiple barriers, which may include those not prioritized. Hence, this exercise should not be considered as an explicit selection but rather a preferential ordering.





# Chapter 3

## Target Behaviors



### 3.1 Pre-diagnostic Target Behaviors

The project team had, in the initial stages of the project, created a broad set of target behaviors for teachers and teacher coaches - known as Academic Resource Person (ARP) in Uttar Pradesh. The purpose of these target behaviors was to act as a compass for the project till we developed a refined list of target behaviors that were specific and tailored to context, informed by the diagnostic findings. The broad target behaviors, detailed in the table below, guided the preliminary literature review and diagnostic study.

**Table 2: Pre-diagnostic Target Behaviors**

Teachers	ARPs (teachers coaches)
<p>Teachers to use effective instructional practices, this means teachers:</p> <ol style="list-style-type: none"> <li>1. Use <b>structured pedagogy tools</b> (teacher guides, workbooks and other TLMs) while teaching</li> <li>2. Use <b>evidence based practices</b> (balanced literacy, concrete-pictorial-abstract, gradual release of responsibility etc)</li> <li>3. Regularly track student progress and identify struggling learners by asking questions during lessons, conducting <b>regular assessments</b> and using test data to <b>remediate</b> learning gaps and inform future instruction</li> </ol>	<p>ARPs to:</p> <ol style="list-style-type: none"> <li>1. Complete the target number of <b>classroom visits</b></li> <li>2. Regularly monitor teaching practices through <b>classroom observations</b> and fill classroom observation form</li> <li>3. Provide teachers with <b>actionable feedback</b> and support to improve teaching practices</li> <li>4. Motivate teachers by <b>recognizing</b> and sharing best practices after classroom visits</li> </ol>

### 3.2 Refined Target Behaviors

The findings from the diagnostic allowed for narrowing down of these broad target behaviors to specific behaviors that the interventions could be precisely mapped to. The classroom observation data from the diagnostic provided insights on six dimensions of classroom instruction - i) classroom management, ii) teaching learning processes, iii) student engagement, iv) assessments, v) literacy instruction, and v) numeracy instruction. Pertinent

findings across the dimensions were used to sharpen the broad target behaviors into specific teacher practices. These teacher practices then became the final target behaviors for informing the intervention design. Of the pre-diagnostic target behaviors, the focus on assessment informed instruction (All) was eliminated from the final list as All was considered to be a more advanced skill for the teachers.

**Table 3: Final Target Behaviors**

Diagnostic Findings	Target Behavior
Teacher guides were used in only 40% of classrooms. <i>The use tended to be performative for demonstrating compliance.</i>	Teachers use the prescribed guide for planning and teaching.
Check-for-Understanding questions (CFUs) are widely practiced but responded with chorus answers <i>limiting teachers' ability to gauge breakdowns and address misconceptions.</i>	Teachers take student responses effectively.
A high percentage of teachers addressed different domains (89%) but practice was largely observed to be ineffective (72%). (For instance, certain aspects of decoding <sup>6</sup> are not followed - traditional methods adopted.)	Teachers teach all domains of Balanced Literacy - with a skill focus on decoding.
A majority of teachers (77%) practiced the steps for Gradual Release of Responsibility but more than half of them did not practice it in the right order or practiced with unclear transitions (57%).	Teachers follow all steps of Gradual Release of Responsibility in the correct order to teach a new concept in Numeracy.
Teacher feedback showed variation - with some teachers not correcting student work, others doing it superficially, and some giving feedback. There was limited evidence of regular (formative) assessments in 46% of the classrooms observed.	Teachers give students dedicated time for student practice - individually and in groups - with feedback.

<sup>6</sup> The ability to pronounce written words by applying prior understanding of letter-sound relationships and letter patterns.

Target behaviors pertaining to ARPs were eliminated from the scope of the project due to ARPs' limited ability to influence teacher behavior. The diagnostic revealed that teachers do not perceive ARPs as an immediate support system (ARPs were placed in the outermost circle in the social mapping exercise). Furthermore, the allocation of all ARPs to all teachers in the block (a systemic barrier) weakens the teacher-ARP relationship as different ARPs make successive monthly visits to a given school. For these reasons, ARPs were deprioritized as a stakeholder in influencing teacher behavior for the purpose of this project.

### 3.3 Teacher Actions & Student Actions for Target Behaviors

Each target behavior has been deconstructed into observable teacher actions and corresponding student actions. Teacher actions then become a parameter for informing any shift in target behaviors thereby limiting the ambiguity of assessing behavior change. Corresponding student actions enable us to comment on whether the shift in target behaviors is effective (in achieving desired outcomes) or merely ritualistic/performative. Teacher actions and student actions for the respective target behaviors are listed in the table below.

**Table 4: Teacher Actions and Corresponding Student Actions For Each Target behavior**

Target behavior	Teacher Actions	Student Actions
Teachers use the prescribed guide for planning and teaching.	<ul style="list-style-type: none"> <li>● Teacher has the TG open for reference.</li> <li>● Teacher conducts a particular section of the lesson plan.</li> </ul> <p>Other indicative teacher actions:</p> <ul style="list-style-type: none"> <li>● Teacher mentions the week/day of the TG on the board.</li> <li>● Teacher uses TG to fill the Teacher Diary.</li> <li>● Teacher fills the teaching tracker in the TG.</li> </ul>	<ul style="list-style-type: none"> <li>● Students stay engaged.<sup>7</sup></li> </ul>

<sup>7</sup> Student engagement to be understood as students following instructions and staying on task. A rule of thumb of 70% students engaged to be used as a qualifier.

<p>Teachers take student responses effectively.</p>	<ul style="list-style-type: none"> <li>● Teacher asks students to share real life examples related to the concept.</li> <li>● Teacher asks questions to individual students.</li> <li>● Teacher asks children to explain how they came up with an answer instead of stating right or wrong.</li> </ul>	<ul style="list-style-type: none"> <li>● Students share real life examples related to the concept being taught.</li> <li>● Students answer questions related to the concept when asked.</li> <li>● Students are able to explain how they came up with an answer.</li> </ul>
<p>Teachers teach all domains of Balanced Literacy - with a skill focus on decoding.</p>	<ul style="list-style-type: none"> <li>● Teacher uses a picture/poem/ story/topic to engage students in conversations.</li> <li>● Teacher introduces the target sound through the activity mentioned in the lesson plan.</li> <li>● Teacher makes students practice blending and reading words from familiar varnas.</li> <li>● Teacher makes students read practice blending in groups.</li> <li>● Teacher asks students to write letters/words or draw, as per the sections of the lesson plan.</li> </ul>	<ul style="list-style-type: none"> <li>● Students speak in their home language.</li> <li>● Students have a discussion centered around the topic.</li> <li>● Students identify the target sound independently.</li> <li>● Students read the varna/maatra independently.</li> <li>● Students blend and read words along with the teacher.</li> <li>● Students independently write/draw about the topic.</li> </ul>

<p>Teachers follow all steps of Gradual Release of Responsibility in the correct order to teach a new concept in Numeracy.</p>	<ul style="list-style-type: none"> <li>● Teacher introduces the concept with the help of the activity/gives clear instructions for the activity.</li> <li>● Teacher guides/encourages students in completing the activity.</li> <li>● Teacher asks students questions to assess mastery of the learning objective.</li> <li>● Teacher reteaches the concept if more than 70% of students are not able to answer the questions.</li> </ul>	<ul style="list-style-type: none"> <li>● Students share real life examples related to the new concept.</li> <li>● Students are able to complete the activity individually with the help of the teacher.</li> <li>● Students are able to explain how they came up with an answer.</li> <li>● Students ask the teacher questions/doubts on the concept.</li> </ul>
<p>Teachers give students dedicated time for student practice - individually and in groups - with feedback.</p>	<ul style="list-style-type: none"> <li>● Teacher gives students (either orally or written on the blackboard) problems to solve by applying the concept taught.</li> <li>● Teacher instructs students to independently solve the relevant worksheet for the lesson in their workbooks.</li> <li>● Teacher observes the work of students by moving around the class.</li> <li>● Teacher supports and assists students in completing the worksheet.</li> <li>● Teacher checks students' notebooks and offers corrective/constructive feedback to students.</li> </ul>	<ul style="list-style-type: none"> <li>● Students ask the teacher questions/doubts on the concept.</li> <li>● Students practice the same concept multiple times in the notebook/worksheet.</li> <li>● Students can independently write/draw about the topic.</li> </ul>

A classroom observation tool including the aforementioned teacher actions and student actions will be used to conduct classroom observations to assess the shift in target behaviors as one component of the intervention evaluation.

### 3.4 Phased Progression

Given the pedagogical incline of the target behaviors juxtaposed with the barriers pertaining to cognitive overload, a stacked approach has been taken to the target behaviors to increase teacher acceptance towards the behaviorally-designed interventions. Certain behaviors are targeted consistently across the deployment period (eg, *Teachers use the TG for planning and teaching*), while others are targeted in a phase-wise manner (eg, *Teachers take student responses effectively*).

**Table 5: Phase-wise Progression of Target Behaviors**

Phase 1 (Sept/Oct)	Phase 2 (Nov/Dec)	Phase 3 (Jan/Feb)
Teachers use the prescribed guide for planning and teaching.	Teachers use the prescribed guide for planning and teaching.	Teachers use the prescribed guide for planning and teaching.
Teachers take student responses effectively.	Teachers teach all domains of Balanced Literacy - with a skill focus on decoding.	Teachers follow all steps of Gradual Release of Responsibility in the correct order to teach a new concept in Numeracy.
Teachers give students dedicated time for student practice - individually and in groups - with feedback.	Teachers give students dedicated time for student practice - individually and in groups - with feedback.	Teachers give students dedicated time for student practice - individually and in groups - with feedback.



## **Chapter 4**

### **Intervention Ideas - Version 1**



## Step 1: Ideation Workshop

In parallel with refining the target behaviors and prioritizing barriers, the project team also initiated the intervention design process. As a first step, the team conducted an ideation workshop where project team members were encouraged to engage in blue sky thinking in line with the (working version of) target behaviors and barriers to arrive at possible intervention ideas. The team created a long-list of intervention ideas, with some overlaps, through this exercise.

Positive messages for teachers from students/ parents/ community	Creating positive teacher image as ray of hope for students	ARPs to track and reward early adopters	Create a reward system for teachers using effective teaching practices
Focussed support from headteachers	Breakdown of teacher guides into achievable steps	Communication campaign on NIPUN Program narrative setting	Positive, and not compliance-based, messaging around program goals
Showing teachers how the problem is within their locus of control	Demonstrating effective practices in a realistic classroom	Work with headteachers to be a sounding board for teachers	Videos of stories of change
Creation of chatbot	Bite-sized videos on prioritised micro-practices	Games/ interactive videos for empathy building	Searchable lesson plans through dedicated app
Promotion of effective micro-practices	Redesign teacher training model	Publicise efforts by government to engage other stakeholders	Motivational messages and reminders
Using town halls to build trust in system	Flashcards or small booklet that focuses on 'how to teach' not 'what to teach'	Get teachers to evaluate classes/ videos on effective practices	Creating a module/tool for assessment informed instruction

Figure 2: Ideas Collage from the Ideation Workshop

## Step 2: Literature Review

A literature review was undertaken simultaneously to add to the list of ideas any interventions that had evidence of impact in similar contexts. A study by IDinsight evaluated the effectiveness of STiR Education's program in Delhi and Uttar Pradesh. The STiR program was organized into two approaches, Standard and Exploratory. The Standard program focused on enhancing intrinsic motivation - through methods such as having teachers form a local social network to discuss classroom practices, participate in reflective exercises, conduct family visits for underperforming students, and regular check-ins with the Education Leader (STiR staff). The Exploratory program, in addition to focusing on intrinsic motivation, also focused on increasing extrinsic motivation through non-financial incentives such as recognition posters for teachers, or a chance to visit other schools for increased exposure. Both Standard and Exploratory approaches were found to have a statistically significant positive impact on student learning outcomes in Delhi, interestingly no such significant impact was found in Uttar Pradesh<sup>8</sup>.

The Primary Math and Reading Initiative introduced in Kenya comprised interventions leveraging information and communication technology (ICT) in education to expand learning opportunities, facilities, and channels of delivery. The program aimed to assess the effectiveness of Tutor Tablets, Teacher Tablets, and Pupil e-readers in improving learning outcomes. The results of the study found that pupils in all three treatment groups scored significantly higher statistically on key outcomes compared to pupils in the control group.<sup>9</sup>

Another study from Andhra Pradesh aimed at increasing teachers' intrinsic motivation studied an intervention that provided teachers with diagnostic feedback on student performance based on a baseline test. The study evaluated shift in teacher activity using an index comprising 15 measures such as giving tests, asking questions, writing on the board, encouraging student participation, used during classroom observations. The study found that diagnostic feedback on student performance led to a significant increase in teacher activity<sup>10</sup>.

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<sup>8</sup> Goyal, S., Fraker, A., Shah, N., Abraham, R., et al. (2018) Impact of STiR's programming on teacher motivation and student learning. Endline Report. IDinsight.

<sup>9</sup> Piper, B., & Kwayumba, D. (2014) USAID/Kenya Primary Math and Reading (PRIMR) Initiative: Kisumu Information and Communication Technology (ICT) Intervention. Endline Report. Research Triangle Institute (RTI) <https://www.eddataglobal.org/countries/index.cfm?fuseaction=pubDetail&ID=664>.

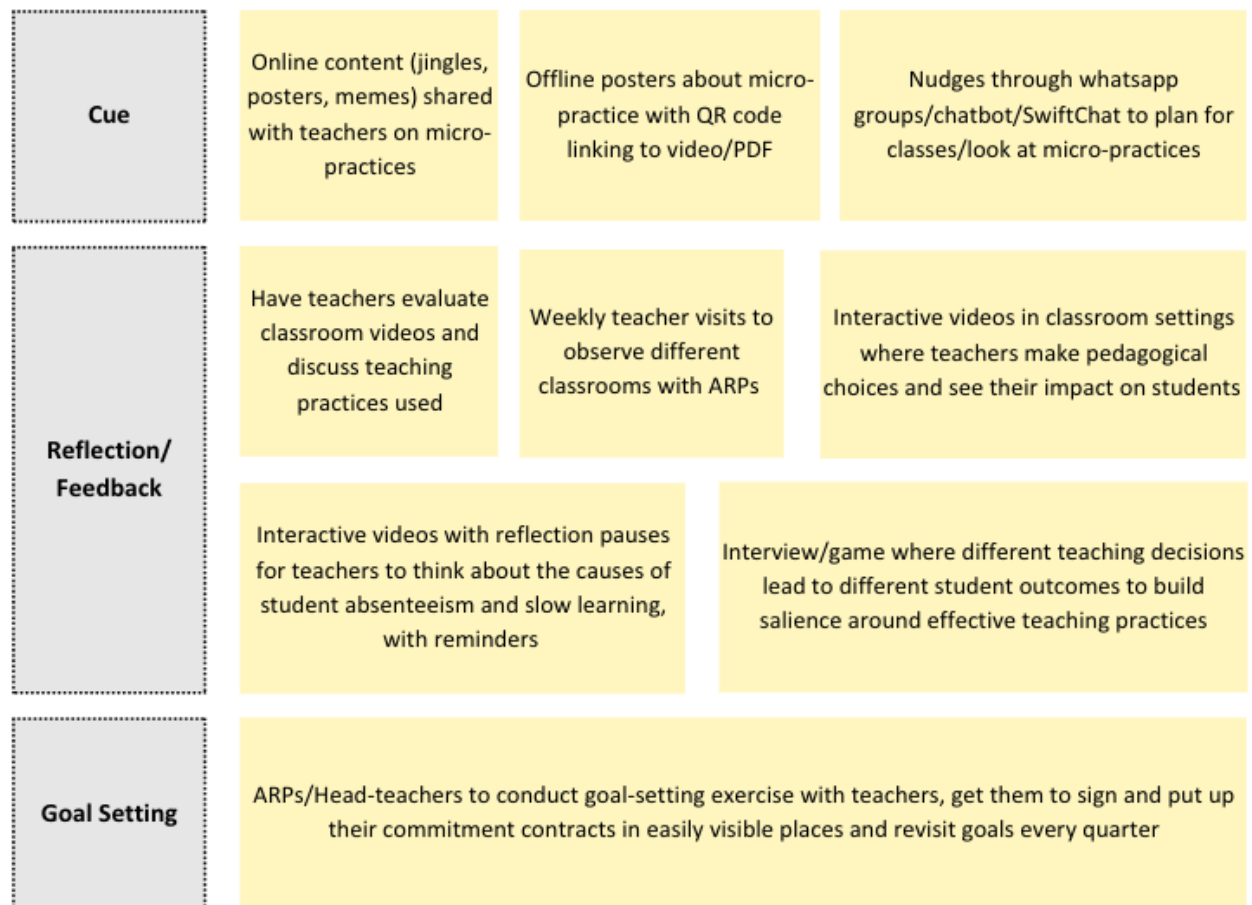
<sup>10</sup> Muralidharan, K., Sundararaman, V., (2010) The Impact of Diagnostic Feedback to Teachers on Student Learning : Experimental Evidence from India. The Economic Journal.

## Step 3: Identify Intervention Components

The team deconstructed the ideas in the long-list into intervention components to declutter the design process, making the intervention ideas precise and specific. The key intervention component - also referred to as the 'active ingredient' of any intervention - is observable, replicable, and irreducible component of an intervention designed to alter or redirect processes that regulate behavior<sup>11</sup>. The intervention ideas the project team had arrived at were thus broken down into smaller 'active ingredients'.

All active ingredients (and variations) identified through this exercise were sorted into nine broad categories based on the core behavioral change principle. The categorization is detailed below.

**Figure 3: Intervention Components Sorted Into Buckets**



<sup>11</sup> [Michie et. al. \(2013\). The behavior change technique taxonomy \(v1\) of 93 hierarchically clustered techniques: building an international consensus for the reporting of behavior change interventions. \*Annals of behavioral medicine\*, 46\(1\), 81-95.](#)

<b>Social Comparison</b>	Share evidence, case studies from other schools/contexts of positive impact of good teaching practices employed by other teachers to encourage adoption of effective teaching practices			
<b>Leveraging Emotions</b>	Appreciation video messages for teachers from students/parents/ community	Interactive videos to build identity of good teacher using effective practices, fighting classroom challenges, experiencing success	Short messages for teachers about purpose of the NIPUN Mission, their important role	Communication campaign in public settings to affirm teacher problems/hype role
<b>Micro-Practice</b>	Flash-cards of teaching practices with different shades indicating both theme and time	PDF/ videos, with scaffolding of practices, short clear steps for the practice	Quarterly interactive poster with key principle, weekly goals, activity material and road-map template	Micro-practice videos in realistic classrooms, with evolving focus practices
	Use of technology (e.g. SWIFT App) to communicate shorter lesson plans to teachers focusing on 1-2 micro-practices at a time, with an offline alternative of flashcards with micro-instructions		Simplified information campaign focusing on essence of program, interactive videos about evidence based practices and how they can be employed and videos about micro-competencies	
<b>Training</b>	Providing training to teach in a multigrade classroom	'I do, we do, you do' training for teachers for multigrade classrooms - training (I do), roleplaying practices (we do) and independent implementation (you do)	Repurposing training to focus on building knowledge, capacities and acceptance for effective teaching practices, and communicating in an engaging way	GRR for teachers - giving structured lesson plans and gradually reducing instructions as they become more competent.
<b>Recognition</b>	ARPs share exemplar teacher videos where these teachers are demo-ing the practice	Community building exercise where nearby schools hold a meet for teachers to discuss effective teaching practices and recognise teachers using these practices	Culmination event where teachers employing micro-practices well are recognised by officials	
	ARPs identifying and felicitating teachers using effective practices through personal recognition, sharing on WhatsApp and community function in the village	ARPs identify teachers practicing the behaviour, recognise them on teacher WhatsApp groups/ Shikshak Sankuls, send appreciation letter from district official	Recognition based on nomination from peers and ARPs	
<b>Social Support</b>	Head-teachers follow up, provide feedback and drive norming about micro-practice	Reflection sessions with other teachers/ head-teachers about FLN, where teachers can provide solutions/appreciate efforts.	Social platform for teachers - online interactive app to post ideas/challenges and get responses and offline poster in school common spaces to share thoughts	

## Step 4: Rating Exercise

These ideas were assessed using a customized EAST (Easy, Attractive, Social, Timely) Framework, comprising:

- **Facilitating Ease:** Leveraging defaults, minimizing effort, and simplifying communication by breaking objectives into achievable steps.
- **Enhancing Attractiveness:** Engaging visuals, personalization, and integrating incentives and sanctions.
- **Leveraging Social Factors:** Capitalizing on peer effects, social networks, and commitment strategies.
- **Optimizing Timing:** nudging people when they are most receptive, providing reminders

This framework, alongside the EAST principles, incorporated feasibility, acceptability, and scalability indicators. Feasibility involved resource and technical evaluation, acceptability gauged audience reception, and scalability assessed potential scaling to the entire State.

## Step 5: Development of Treatment Arms

Ideas that fared well on these parameters were then presented to the leadership at CSF and CSBC as well as other teams within CSF that work extensively on the field in Uttar Pradesh - the Classroom Instruction and Practice team and the State Reform team. Feedback was sought on whether these ideas would fare well at the ground level with focus on the relevance of ideas, overlaps with existing features of the NIPUN program (if any), and acceptability by teachers.

Based on the insights that arose in these meetings, the ideas were further filtered and packaged to form two treatment arms, with variations.

### Treatment Arm 1

#### Mapped Target Behaviour

Teachers use the prescribed guide for planning and teaching.

Promoting adoption of Teacher Guides:

- Make it easy to access key information through a chatbot

- Draw attention to usage of TG, importance of preparation/planning, benefits etc through meta-aids such as audio notes/podcasts and a goal progression mechanism
- Regular reminders using positive deviance and social proof

**Variation** - With and without Goal Progression

**Table 6: Detailed Components of Treatment Arm 1**

<b>Component</b>	<b>Design Details</b>
<b>ChatBot</b>	<ol style="list-style-type: none"> <li>1. A Navigator to aid teachers in using the teacher guide and find relevant lesson plans easily.</li> <li>2. A FAQ/Helpline to answer common questions teachers have about use of TG or teaching in general.</li> </ol>
<b>Goal Progression</b>	A goal progression chart for teachers designed to motivate them to use the TG to move along the path outlined in the goal progression, with rewards embedded in the design (for example, through 'scratch to earn reward' after attaining a certain number of goals).
<b>Audio Recording/ Podcasts</b>	Short podcast style audio recordings for teachers to make the TG more accessible, easier to use, and address common implementation problems faced by teachers in the classroom.
<b>Reminders/ Positive Messages</b>	<ol style="list-style-type: none"> <li>1. Reminders along with positive messaging sent to teachers regularly to remind them to use TG. Messaging can be made stronger by sharing audio/videos of a local celebrity messenger.</li> <li>2. Messaging around flexibility/agency - remind teachers to space out the 22 weeks of TG.</li> </ol>

## Treatment Arm 2

### Mapped Target Behaviors

- Teachers take student responses effectively.
- Teachers teach all domains of Balanced Literacy.
- Teachers follow all steps of Gradual Release of Responsibility in the correct order to teach a new concept in Numeracy.
- Teachers give students dedicated time for student practice - individually and in groups - with feedback.

Increase adoption of key pedagogical practices by-

- Providing information on micro practices through attractive videos that leverage emotions to inspire action, address common classroom breakdowns and demonstrate desired practice in relatable settings
- Regular reminders to reinforce participation (using social proof, positive deviance)

**Variation 1** - Recognition as a reward for adoption of practices

**Variation 2** - Social support from school leaders

**Table 7: Detailed Components of Treatment Arm 2**

Component	Design Details
<b>Micro-practice videos</b>	<ol style="list-style-type: none"> <li>1. Catchy jingle as an opening to leverage affect and establish what the video is about. Eg. <i>Ek do teen, main hoon shikshak uteern.</i></li> <li>2. Inspiring call to action through a relatable character and framing specific content using relatable classroom problems.</li> <li>3. Demonstration of micro-practice being focused on by giving teachers three actionable steps.</li> <li>4. Highlight clear, immediate benefits of doing the desired behavior.</li> </ol>
<b>Reminders</b>	<p>Reminders will be of 3 types:</p> <ol style="list-style-type: none"> <li>1. Simple reminders - messages reminding teachers to use focus practices.</li> <li>2. Value-based reminders - messages emphasizing the benefits or relevance of focus practices.</li> <li>3. Motivation reminders - messages using social proof and positive deviance to motivate teachers to use micro-practice.</li> </ol>



	Messages with key information about the micro-practice placed in teachers' environment (e.g. staff room) or shared over WhatsApp.
<b>Reward and Recognition for teachers</b>	<ol style="list-style-type: none"> <li>1. Nomination - Teacher nomination by different stakeholders and teachers themselves based on demonstration videos shared.<sup>12</sup></li> <li>2. Evaluation - Selection committee comprising teachers, ARPs and Sankuls will evaluate videos to select teachers of the month.</li> <li>3. Monthly recognition - Poster of selected teachers to be displayed in the BEO's office and circulated on whatsapp teacher groups.</li> <li>4. Year-end reward and recognition - Top 10 teachers will be rewarded by someone they value (BSA/State official/celebrity).</li> </ol>
<b>Social support for teachers from School Leaders</b>	<ol style="list-style-type: none"> <li>1. Weekly meetings for teachers with school leaders in semi-structured format - school leaders given talking points and activity ideas based on focus micro-practice, with open space for teachers to voice concerns/problems.</li> <li>2. School leaders to be trained on providing more structured mentorship/feedback/encouragement to teachers.</li> </ol>

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<sup>12</sup> The demonstration videos are an important way to assess adoption of practices. The component may be modified based on teacher feedback on effort and feasibility.

# Chapter 5

## Low-Fidelity Prototyping



## 5.1 Objective

Certain components from the first version of our treatment arms were taken to the field to test the intervention ideas using low-fidelity prototypes. The broad objective of this exercise was to gather insights on content consumption practices amongst the users, to develop an understanding of likelihood of uptake/acceptance of the intervention components, and to elicit an initial round of feedback from the users that could be accounted for in the intervention design. We tested design concepts for the following intervention components:

- Micro-practice Videos
- Social support
- Audio-note
- Chatbot

All interactions with the users were exploratory and qualitative in nature, and conducted within the study districts, Sitapur and Hardoi. In-depth discussions were conducted with a total of 33 respondents comprising 24 teachers and 9 school leaders.

## 5.2 Methodology and Tools

To validate the design concepts, the project team created draft versions of the ideas and developed semi-structured discussion guides. These discussions were contextual and participatory, recording respondents' reactions and suggestions. The insights collection process followed the steps below:

### **A. Micro-practice Videos (MPV)**

Teachers were shown two types of videos: a short (2-minute) classroom demonstration and a longer (13-minute) instructional demonstration. They shared thoughts on content, design, relevance, character relatability, ideal length, viewing platform preferences, and improvements. Teachers also discussed non-teaching video content they consume and enjoy.

## B. Social Support

A role-play activity engaged a school leader and teacher in a support system demonstration. The script included ice-breaking, watching a teaching video, discussing the relevance of the micro-practice, challenges faced, and goal-setting. Feedback was collected on feasibility, relevance, and suggestions for improvement.

## C. Audio-note

A 1-minute audio-note sample was played for teachers, focusing on empathy, common challenges, and solutions. Feedback covered content, design, likability, relevance, duration, tonality, voice modulation, deployment preferences, platform, and frequency.

## D. Chatbot

Teachers were introduced to a chatbot concept with visual aids and examples. Follow-up questions explored utility, comfort level, feasibility, uptake likelihood, and general acceptance of a tech-based teaching aid.

## 5.3 Key Findings

Observations and findings from the field interactions are detailed in the table below.

**Table 8: Findings from Low-Fidelity Prototyping**

Content	Design Concept	Deployment
<b>Micro-Practice Videos</b>		
1. There was mixed response as to which of the two sample videos was better. However, teachers indicated a general preference towards videos with both detailed explanations and classroom demonstrations.  2. Teachers receive a lot of information through training,	1. Most teachers prioritized the content of the video over its length, indicating an overall preference for videos that are easy to follow. The preference for length ranged from 2-15 minutes.  2. It was suggested that having an informal and friendly tone, and adopting a story-like format can	Most stated preferences for time, frequency and platform were:  → Time: Evening (free time and internet connectivity is better at home)

<p>and hence expressed a preference for content that is novel and not repetitive. It was also suggested by a few teachers that videos should discuss solutions to problems that do not receive sufficient attention in training, for example, manage multi-grade classrooms or high incidence of student absenteeism, teach in low-resource settings etc.</p>	<p>make the videos more engaging.</p>	<p>→ Platform: WhatsApp group → Frequency: Weekly</p>
<p><b>Social Support</b></p>		
<p>1. Regarding the topics that can be discussed in the weekly meetings, some suggested that topics can be decided on the spot while others suggested that the topics should emphasize on improving attendance and learning levels of the children.</p>	<p>1. Some believed that the idea would only work if the teachers are willing to listen to the SL and engage with them on a regular basis, whereas few teachers indicated that the idea will not work unless SL is regular and diligent.</p> <p>2. Few did not see any value-add or novelty in the idea, and expressed concerns around time constraints.</p> <p>3. SLs also mentioned that in some instances teacher in-charge (ad-hoc head teachers) and teachers are almost similar in their position and the head-teacher in these situations have limited authority to provide adequate mentorship.</p>	<p>Most stated preferences for frequency and duration were:</p> <p>→ Frequency: Fortnightly → Duration: 15-20 minutes</p>

<b>Audio-note</b>		
<p>1. Some teachers suggested that solutions in the audio note should not be generic but rather focussed on addressing different types of challenges faced by different teachers.</p> <p>2. It was suggested that besides acknowledging the hardships or difficult lives of teachers, the audio-note could also start on a motivating or appreciative note, such as - "<i>You all are giving your 100 percent, we want to boost your morale further.</i>"</p>	<p>1. Teachers indicated a preference for shorter audio-notes ( 2-10 mins) as they felt that lengthy notes can get boring.</p> <p>2. Moreover, teachers felt that a video in the same format, i.e. providing solutions to common challenges, can be more appealing, and will help them visualize the solutions better, as opposed to an audio-note.</p>	<p>Most stated preferences for time, frequency and platform were:</p> <p>→ Time: Evening (free time and internet connectivity is better at home)</p> <p>→ Platform: WhatsApp group</p> <p>→ Frequency: Weekly</p>
<b>Chatbot</b>		
<p>1. Although teachers considered the TG to be a useful resource, they found the language too technical or difficult to comprehend. They felt that having access to simplified information on daily lesson plans from TG could make their tasks easier.</p> <p>2. Few teachers also felt that summaries and snippets from the TG could help them in filling the teacher diaries (a journal of lesson plans teachers refer to prepare for next day's lesson).</p>	<p>Some of the ideas pertaining to chatbot features that teachers expressed interest in were:</p> <p>1. Audio-summaries of daily lesson plans as it would help them multitask and provide them the information in the TG in a simplified and bite-sized format.</p> <p>2. Textual-summaries, which include page number, lesson plan objectives, and a lesson plan overview.</p> <p>3. Video demonstration of activities provided in the TG.</p> <p>4. Voice commands for smoother interaction with the bot.</p>	<p>Some issues raised by teachers that might hinder the usage of the Chatbot:</p> <p>→ Low storage space and overheating issue of phone devices</p> <p>→ Low internet connectivity in their area</p>

	5. Audio-notes on decoding, which students can listen to for understanding phonetics.	
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Based on the feedback and insights garnered from teachers through the low-fidelity prototyping, the project team decided to go forward with the micro-practice videos and the chatbot components while incorporating suggestions from the teachers to enhance their user-friendliness and palatability. The audio-notes were repurposed to become a chatbot feature as opposed to an independent intervention component and the social support component was dropped in alignment with teacher feedback.

## Chapter 6

### Treatment Arm 1: Chatbot





**Table 9: Pathway to Behaviour Change**

Idea	Input	Logic of interventions				Intervention Details				Discussion		
		Barriers Targeted	Mechanism	Behavioral Outcomes	Monitoring Parameters	Method	Elements	Deployment	Mock Up	Pros	Cons/Risks	Assumptions
<b>A WhatsApp Chatbot to Guide Teachers in Planning Lessons</b>	Making the teacher guide easier and more accessible to increase the likelihood of teachers referring to the TG and apply the prescribed process and practices	Teachers' limited use of TG for planning and teaching could be explained by following the barriers: → High perceived cost & low perceived value of adoption → Feeling of limited agency → Limited user-centricity of TGs, and limited know-how of implementing the TGs → Focus on compliance → Belief that class preparation is not important	Easy access to TG's content along with positive messaging around TG's usage, and a sense of progression associated with completion of daily lesson plans will get teachers habituated to using TGs for planning and teaching	→ Teachers use chatbot daily to access information in TG → Teachers start finding TGs easier to use/They have more knowledge on how to implement TG and TLM in the classroom → Teachers are able to bring more structure to their classroom instruction → Teachers find it easier to prepare for next day's class	→ Engagement level with Chatbot measured through no. of teachers accessing the chatbot daily/weekly, and no. of clicks per day → Engagement level with TG measured through self-reports and classroom observations	The intervention will be presented as a WhatsApp chatbot that has a simple interface that all teachers are familiar with. The chatbot will allow teachers to access the TGs in a succinct way, both in text and audio formats.	→ Text Message → Audio Message → Positive Reinforcement & Recognition	The chatbot will be introduced and deployed with approximately 720 teachers in Hardoi and Sitapur districts of Uttar Pradesh versus 720 control teachers	Fig 4	→ The chatbot will increase the likelihood of teachers accessing TG and adhering to prescribed teaching practices. → Reduce cognitive overload caused by existing TG → Will allow teachers to access their lesson plans anytime, and help them with preparation	→ Teachers may access the chatbot more than the TG or use it as a substitute for TG instead of considering it as a supplementary aid. → Teachers may not engage deeply with the lesson plan and only utilize the chatbot to get a high level understanding	→ There is enough internet bandwidth for teachers to access the WhatsApp chatbot.

## 6.1 Theory of Change

The first treatment arm intends to increase adoption of TGs by making accessible to teachers simplified summaries of daily lesson plans in the form of bite-sized texts or audio-notes through a WhatsApp Chatbot. A series of clicks and simple entries will enable teachers to get acquainted with the content of daily lesson plans for literacy and numeracy in a few seconds. This will be supplemented by friendly nudges and positive messaging around the use and benefits of TG and an in-built reward mechanism to aid habit formation.

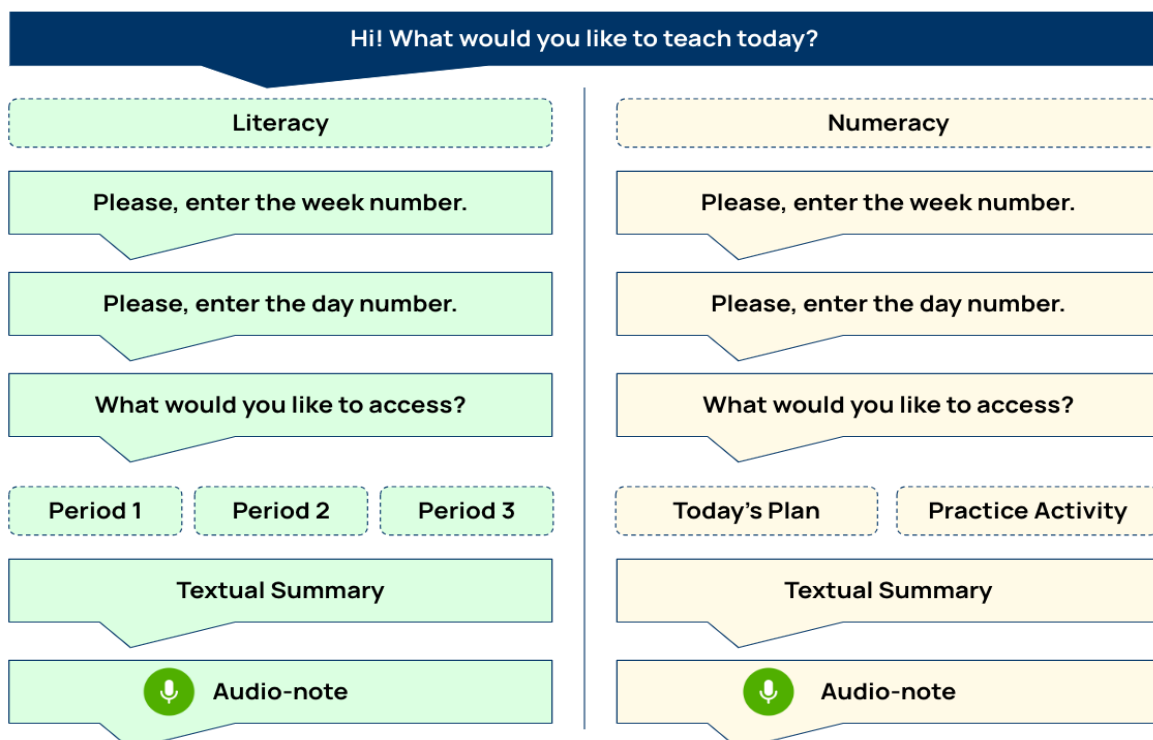
By increasing access and familiarity through simplified information and building acceptance and motivation through reminders and a reward mechanism, this treatment arm intends to reduce resistance towards complete adoption of the TG and gradually lead to habit formation for using the TG for planning and teaching. Table 9 (on page 38) summarises the pathway to desired behavior change. Supplementary table S1 lists how the interventions map to the barriers.

The following sections further detail out different components of this intervention arm and accompanying behavioral and design principles, effectiveness of which will be tested through our experiment.

## 6.2 Component 1: Textual Summary and Audio-notes

### A. Chatbot Flow

Figure 4: Overview of Chatbot Flow



The figure above provides a depiction of the conversation flow that the chatbot will adopt.

- Upon opening the interface, the user will be first asked to choose which subject they wish to teach, literacy or numeracy, they will then be asked to enter the week and day (in numerals) for which they would like to access the lesson plan.
- To ensure that the chatbot mirrors the structure of the TG, for literacy, users will be further asked to select the desired period and, for numeracy, users will be asked to choose between the lesson plan for the day or the practice activity.
- This final selection will give the desired output in the form of a text snippet/summary and an audio recording of the selected plan.

## B. Textual Summary

The text summary will include the learning objective, materials required for the lesson, a short summary of the lesson plan in bulleted format, page number of the corresponding worksheet (wherever applicable), and references to page numbers in the TG where they may find detailed instructions.

Figure 5: Features of Textual Summary

<p><b>समय वितरण</b> 🕒</p> <p>गतिविधि 1: 7-10 मि. गतिविधि 2: 10-15 मि. लेखन : 10-15 मि.</p>	<p>Time Allocation</p>
<p><b>शिक्षण उद्देश्य</b> 🎯</p> <p>विद्यालय और साथियों से जुड़ाव।</p>	<p>Learning Objective</p>
<p><b>विषयवस्तु   तैयारी</b> ✅</p> <p>आप खेल से संबन्धित जरूरी सामग्री पहले से एकत्र कर लें।</p>	<p>Materials Required</p>
<p><b>गतिविधि</b></p> <ul style="list-style-type: none"> <li>- खेल गतिविधि 'शब्द अंत्याक्षरी' (page 153)</li> <li>- क्रिया के साथ बच्चों का परिचय 🙏👏👏</li> <li>- 'अभिवादन गतिविधि' (page 156)</li> <li>- मनपसंद खेल से सम्बन्धित चित्र (🖼️)</li> <li>- 🧐🧐 चित्रों पर कुछ शब्द लिखे और साथी को दिखाते हुए चर्चा।</li> <li>- कुछ बच्चों को आगे बुलाकर चर्चा</li> </ul>	<p>Bulleted Summary of a Lesson Plan (Literacy, Period 1)</p>

### C. Audio-note

The audio-note will be a recording of the lesson plan with the intention of helping teachers to get familiarized with the lesson plan and its components for a particular day with reduced (cognitive and time) effort. The audio-note makes minimal changes to the lesson plan instruction as given in the TG. It addresses the teacher in second person. The audio-note starts with a greeting and ends with an encouraging message with a nudge to refer to the TG. Audio-notes are mapped to periods as opposed to lesson plans, that is, one literacy lesson plan is broken down into three periods, with one audio-note for each, whereas one numeracy lesson plan is for one period and has one audio-note. Numeracy, additionally, has audio-notes for each day's practice activities. The team is creating a total of 553 audio-notes, 139 for numeracy and 414 for literacy.

*Resource: A sample audio for Day 1 of Week 1 for Numeracy can be found [here](#).*

### D. Design Elements

Certain design elements will be embedded into the chatbot to make the lesson plan information comprehensible and visually appealing for the user.

- **Concise** - Textual summaries will be properly spaced and limited to 5-7 lines (of prompts) on the screen to avoid cognitive overload. Audio notes will be 2 minutes long on average.



Figure 6: Numeracy Lesson Plan and Corresponding Textual Summary

- **Searchable** - Minimal effort will be required from the user and they will be able to get the desired response from typing in a few letters/numbers, after 2-3 clicks/inputs.
- **Attractive** - Emojis/Icons will be included in the text messages to make the interface visually appealing for the users and reduce the amount of text. Similar iconography as in the TG will be used so that the user can easily (and subconsciously) connect the information in the chatbot to that in the TG.
- **Relatability** - Voice in the audio-note will be relatable and contextual.

## 6.3 Component 2: Reminders

### A. Period-change Reminders

To further nudge teachers to bring structure to their teaching practice and adopt crucial instructions provided in TG, friendly reminders will be sent to teachers in a timely fashion at the beginning of each period<sup>13</sup> to:

- help them manage their teaching time better,
- remind them to spend dedicated time on each segment of the lesson plan, and
- encourage them to teach in the most effective order.

This component of the intervention arm is informed by the '*make it timely*' principle of EAST framework. The intention is to prompt teachers at a time when they are likely to be most receptive to adopt the desired behavior (i.e. follow instructional material in the prescribed order and efficiently manage time to cover different segments of the lesson plan).

### B. Social-proof Engagement Messages

Messages regarding the number of users engaging with the app will be broadcasted occasionally to act as social-proof and positive reinforcement, especially for users with limited or no engagement.

### C. User Demonstration Request

Users will be encouraged to share videos of themselves implementing the plan and activities from the TG in the classroom.

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<sup>13</sup> The state time-table can be found [here](#).

## 6.4 Component 3: Rewards

### A. Weekly 'Streak'

A streak will be measured through the number of days a teacher has accessed the chatbot in a week. The streak would be used for a weekly reward system where a rewarding message in the form of stickers will be shared with the users appreciating and recognising them for continuously engaging with the chatbot and maintaining their streak. Additionally, inactive or irregular users will be reminded of their broken streak and will be nudged to resume their engagement. The teacher will receive a weekly report on how they used the chatbot; there will be three WhatsApp stickers that capture the following:

1. If the teacher has accessed the chatbot less than one day in the week, the sticker will be a sad sticker reminding them of their broken streak and asking them to resume engagement to win back their streak.
2. If the teacher accessed the chatbot for 2-3 days, it would say, "good job, but try harder next week!"
3. If the teacher has accessed the chatbot for four or more days a week, the teacher will receive a celebration sticker congratulating them and asking them to keep up the effort.

The streak feature is intended to keep the teacher continuously engaged with the chatbot (and the teacher guide) and help with habit-formation. The streak and the accompanying reward messages will act as a push and motivate the users to maintain consistency, whereas a message for a broken streak will leverage the loss aversion bias to remind users of their lost progress and nudge them to stay on track.<sup>14</sup>

### B. Monthly Report Card

Teachers will be given a monthly report card as a visual summary of their engagement with the chatbot. It will summarize information on frequency of engagement and their performance vis-à-vis other teachers, and include an encouraging message to appreciate their effort or nudge them to use the chatbot more often. The purpose of the monthly report card is to appreciate their effort, and at the same time use peer effects/social comparison to encourage engagement.

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<sup>14</sup> <https://blog.duolingo.com/how-duolingo-streak-builds-habit/>



## **Chapter 7**

### **Treatment Arm 2: Micro-practice Videos**





Table 10: Pathway to Behaviour Change

Idea	Input	Logic of interventions				Intervention Details				Discussion		
		Barriers Targeted	Mechanism	Behavioral Outcomes	Monitoring Parameters	Method	Elements	Deployment	Mock Up	Pros	Cons/Risks	Assumptions
<b>Videos on micro-practices to make classroom instruction effective</b>	Demystify the desired teaching behavior by breaking it down into smaller practices and communicating it to teachers through bite-sized demonstrative videos	Ineffective and limited adoption of pedagogical practices by teachers could be explained by the following barriers: → Status Quo Bias/Ownership effect → Cognitive Overload → Feeling of limited agency → Focus on compliance → Use of heuristics to gauge student levels → Limited know-how/Communication Gap → Sub-optimal quality of training → Information Overload → Loss of relevant information	Breaking down pedagogical practices into micro-practices with clear actionable steps, premising it on a relatable problem in a relatable setting, and supplementing it with nudges and positive messaging around effectiveness will help teachers integrate these key practices into their teaching	→ Teachers start using these key pedagogical practices into their day to day teaching → There is an increase in knowledge about these practices → Teachers see value in implementing effective practices → Teachers are able to adapt and contextualize the solutions shown in the videos in their own classroom → Teachers feel more in control of the consequences of their actions	→ Engagement level with micro-practices measured through read receipts, reactions, response to whatsapp polls, and sharing of their own videos on WhatsApp groups → Adoption measured through classroom observations, own-videos shared by teachers and self-reports	A series of videos on micro-practices will be shared with teachers in a staggered manner. Each video will clearly lay out the steps involved in adoption of the practice, and the entire series will be based on a relatable teacher-character presenting these practices as solutions to common classroom challenges.	→ Bite-sized videos on micro-practices → Teacher Testimonial Videos → Nudges and positive reinforcement → Rewards and recognition	The micro-practice videos will be deployed with 720 teachers in Hardoi and Sitapur districts of Uttar Pradesh versus 720 control teachers	<a href="#">Link to a Micro-Practice Video</a>	→ The micro-practice videos will increase the likelihood of teachers adopting the key pedagogical practices → The videos will reduce the cognitive breaking-down practices into smaller, easy-to-follow steps.	→ Given the variations in schools, videos may not be able to address all kinds of challenges faced. → May get drowned in other information being shared to teachers through different sources and platforms	→ Teachers will be able to make a connection between the problems relayed in the video and problems they face

## 7.1 Theory of Change

The second treatment arm intends to increase adoption of key pedagogical practices. The treatment is centered around bite-sized videos on pedagogical practices derived from the target behaviors. Table 10 (on page 45) summarises the pathway to desired behavior change. Supplementary table S1 lists how the interventions map to the barriers. The different components of Treatment Arm 2 are detailed in this chapter with a clear mapping between design principles corresponding elements.

## 7.2 Component 1: Micro-practice Videos

### A. Content Breakdown

- To ensure that the pedagogical practice videos are easy to consume for teachers, each target behavior (that is, each practice) has been broken down into three learning objectives, where each objective represents one micro-practice.
- The four target behaviors are thus translated into a total of twelve micro-practice videos of 3-4 minutes each.

**Table 11: Breakdown of Target Behaviors into Learning Objectives**

Target Behavior	Learning Objective
<b>Phase I</b>	
Teachers take student responses effectively.	Video 1: Teachers ask questions to individual students and provide time to get responses.
	Video 2: Teachers ask questions to all students and provide time to get responses.
	Video 3: Teachers respond to student answers and push their thinking.
Teachers give students dedicated time for student practice - individually and in groups - with feedback.	Video 4: Teachers give students practice time effectively everyday.

<b>Phase II</b>	
Teachers teach all domains of Balanced Literacy - with a focus on decoding.	Video 5: Teachers use a literacy lesson plan with the 4-block approach.
	Video 6: Teachers teach letter sound identification and letter symbol recognition.
	Video 7: Teachers teach segmenting words into sounds of letters and blending letter sounds into words.
Teachers give students dedicated time for student practice - individually and in groups - with feedback.	Video 8: Teachers provide support during everyday student practice.
<b>Phase III</b>	
Teachers follow all steps of Gradual Release of Responsibility in the correct order to teach a new concept in Numeracy.	Video 9: Teachers use the 'I do-We do-You do' structure for numeracy.
	Video 10: Teachers conduct an effective 'I do' activity.
	Video 11: Teachers conduct an effective 'We do' activity.
Teachers give students dedicated time for student practice - individually and in groups - with feedback.	Video 12: Teachers conduct weekly assessments and remediation using the lesson plans.

**B. Video Structure**

- Each video follows a broad structure of Problem - Solution Demonstration - Benefit.
- The video starts with the teacher-actor sharing a problem she faces in the classroom. The problem statement is articulated in a manner to create relevance and reliability for the users, and locate the micro-practice as a possible solution.

- The teacher-actor then demonstrates the micro-practice in a classroom setup. Each micro-practice demonstration is broken down into three clear steps.
- The video ends with the teacher-actor sharing the benefit she has experienced from using the micro-practice.

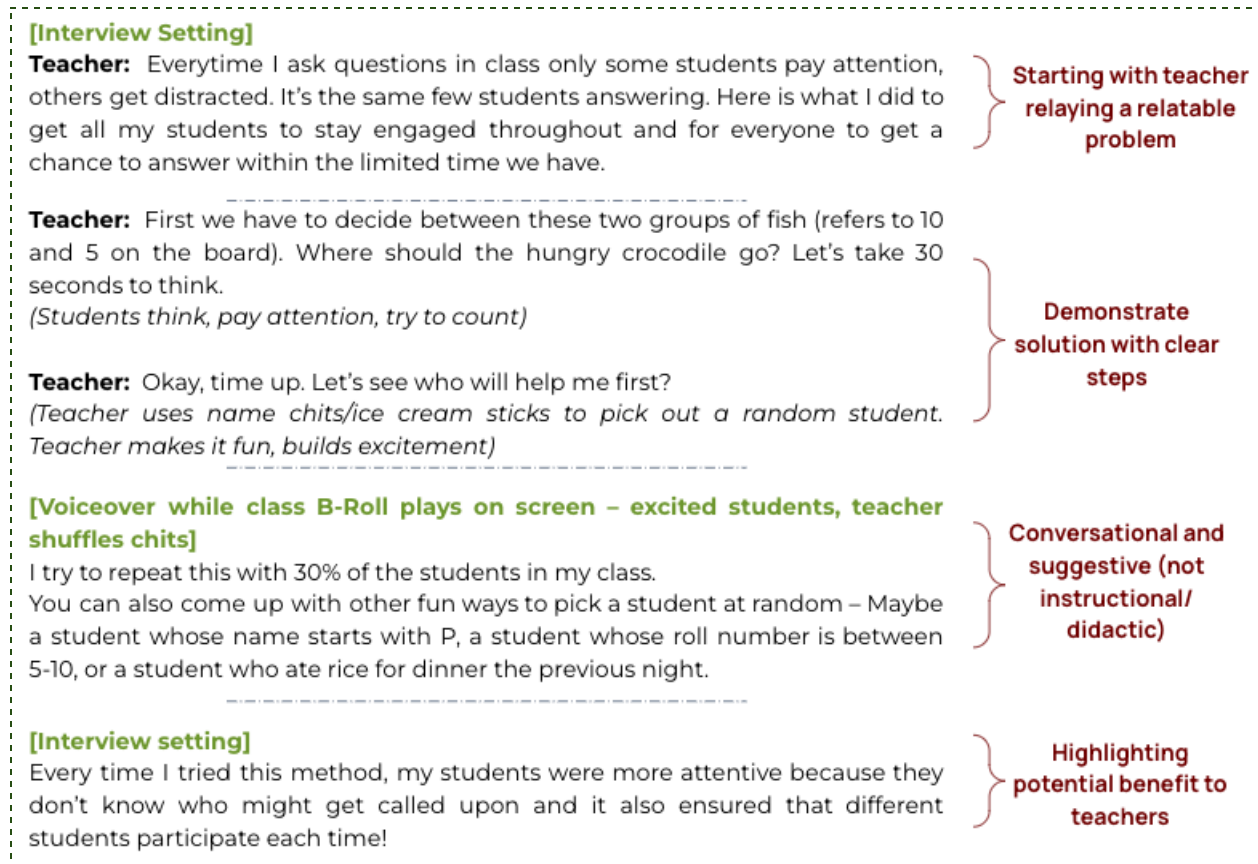


Figure 7: Features of Micro-practice Script

### C. Narrative Building

- **Setting** - The videos have been shot with a teacher-actor and a mix of actor and non-actor students. The location for the videos was an affordable private school in Delhi. Although not identical, the classroom resembles that of a government school in UP. The team added UP NIPUN Mission-specific TLM to the classroom to make it look more relatable. Additionally, the students were dressed in UP school uniforms so that the classroom in the video mirrored the teachers' context as much as possible.



**Figure 8: Still from a Micro-practice Video**

- **Narrative** - The same set of teacher-actor and students have been shown throughout the 12 videos to build a narrative of the journey of a classroom. A video 0 has been created to introduce the classroom and its members as characters to the users.
- **Tone** - The tone of the videos is suggestive and conversational, as opposed to didactic or instructional. The users are nudged to try the practice but not advised or instructed to do so.

#### **D. Additional Elements**

- **Title** - Each video title is a play on a Bollywood movie name to make the videos more attractive to the user.
- **Text-on-screen** - The steps for each practice are highlighted and reiterated through text on screen when a step is being demonstrated.



Figure 9: Text Overlay for Steps of a Micro-practice

*Resource: A sample video (phase 1, video 1) can be found [here](#).*

### 7.3 Component 2: Teacher Testimonial Video

For each micro-practice video a teacher testimonial video will be shared (in the following week) with the users. The video will be a one-minute testimonial that will show an experienced teacher sharing their experience of implementing a particular micro-practice. The testimonials are intended to build salience through a messenger the users consider an expert, but also authentic and relatable. These testimonials will include different implementation challenges and solutions to improve relatability of the content for the users.

The testimonials were made with teachers from other districts in UP to make sure that it doesn't contaminate the treatment or control by way of acting as a reward for teachers being interviewed and their videos being shared widely with other teachers.

### 7.4 Component 3: Reminders

To encourage engagement with the content shared, different types of reminders will be sent



to the teachers.

- **Infographic** - An infographic will be shared after each micro-practice video. The infographic will summarize the information given in the video regarding the practice.
- **Whatsapp Poll** - Basic check-for-understanding will be done through Whatsapp polls for each video. Given the public nature of the answers on a whatsapp poll, the information from the poll will be used to gauge and build engagement more than knowledge regarding a practice. Whatsapp polls will also be used to get feedback on practice implementation from the users.
- **Social Proof Message** - Messages with engagement numbers will be shared to encourage the inactive users to participate leveraging norms.
- **User Demonstration Request** - Users will be encouraged to share videos of themselves using a given micro-practice in their classroom. This will leverage peer effects to boost engagement.
- **Trailer** - A 10 to 20-second clip from the upcoming video will be shared to create anticipation for the video amongst the users.

## 7.5 Component 4: Rewards

To encourage users to engage with the content shared, a rewards and recognition system will be implemented. Regular interactions from the users will be acknowledged and recognised by the group moderators. Notably, users will be rewarded fortnightly and bi-monthly (once in two months) based on clearly defined criteria capturing their engagement with and knowledge & implementation of the micro-practices.

### A. Fortnightly Leaders' Banner

For every micro-practice cycle, teachers will be rewarded for their engagement with the content. A leaders' banner will be shared on the group with the name of teachers who engage with the video, whatsapp polls, and send their demonstration video. Monitoring data on intervention engagement will be used to decide the leaders for that cycle for each group. This reward in the form of social recognition will encourage teachers to engage with the intervention by leveraging peer effects and social comparison.

## B. Bi-Monthly Certificate of Mastery (*Once in Two Months*)

Teachers will also be rewarded at the end of every phase, that is once in every two months, where they will be recognised for having mastered a particular target behavior (pedagogical practice). Teachers' cumulative engagement data over each micro-practice cycle, their performance in a small assessment, and the videos sent in by teachers where they showcase the micropractice in class will be used to assess mastery. The assessment will be a short google form with questions pertaining to the micro-practices shared in that phase. Teachers who demonstrate a cut-off level of engagement and knowledge of a particular target behavior will be given a certificate of mastery (for example, Certificate of Merit for Literacy Instruction) accompanied with a message from the Block Education Officer (BEO). The certificate would act as a tangible benefit for the teachers encouraging them to engage with and apply the micro-practices. The recognition from the BEO will further act as a social reward for teachers.

## 7.6 Deployment Cycle

The micro-practice videos will be shared through Whatsapp keeping in mind user feedback received during low-fidelity prototyping. All teachers assigned to this treatment arm will be added to Whatsapp groups for the duration of the intervention. Each micro-practice video will have a two-week deployment cycle with different components from the treatment.

**Table 12: One Deployment Cycle for a Micro-practice Video**

Day	Content Shared
Sunday	Micro-Practice Video
Monday	Infographic
Tuesday	< empty >
Wednesday	Social Proof (% watched)
Thursday	Whatsapp Poll
Friday	< empty >
Saturday	Social Proof (% correct poll) + User Demonstration Request



<b>Sunday</b>	Teacher Testimonial Video
<b>Monday</b>	Infographic Repeat + User Demonstration Reminder
<b>Tuesday</b>	< empty >
<b>Wednesday</b>	Reward Countdown
<b>Thursday</b>	Reward Announcement
<b>Friday</b>	< empty >
<b>Saturday</b>	Trailer (for next video)

## High-Fidelity Prototyping: Key Stakeholder Groups

After the finalization of the treatment arms and the initiation of the intervention development process, the project team constituted two 'Key Stakeholder Groups' - the first group comprising 4 high-investment teachers and the second with 4 high-investment ARPs. The purpose of creating these groups was to undertake a high-fidelity prototyping exercise, and user-test intervention components in parallel with development. Insights from teachers and ARPs have been used in making the intervention design relatable, user-friendly, and palatable for teachers. Additionally, their inputs were sought on intervention deployment mechanisms.

To form these groups, the project team approached the district administration of both project districts, who recommended 2 teachers and 2 ARPs from their respective districts. The Key Stakeholder Groups for teachers and ARPs were formed with the recommended members. The participants were introduced to the project and their role as part of these groups. Two separate groups were created for teachers and ARPs to avoid influencing opinions given their mentor-mentee relationship.

Two rounds of high-fidelity prototyping were carried out with the both groups through virtual meetings. In the first round, the groups were given a run through of the script prepared for video 1 of phase 1, and in the next round they were shown a rough cut of the same video.

Key feedback points on the script were:

- The strategy introduced in the videos will prove helpful/beneficial for teachers.
- The message of the script is easily understandable and clearly communicated.
- The language of the script is adequate for teachers to understand the concept, they can contextualize the language while using the practice in their class.
- Videos should include aspects of incorrect student responses and teachers remediating to portray a more realistic classroom setting.

Key feedback points on the rough cut of the video were:

- The setting of the video and the characters look largely relatable, but the kids in the video look older than Grade 3 students in their context.
- The language used is easily understandable.
- Alternating between interview & classroom settings is novel and increases engagement.
- The strategy being focused on is depicted clearly.
- To promote the videos they can be linked to existing communication to teachers (eg. NIPUN Lakshya).

# Chapter 8

## Deployment & Monitoring



## 8.1 Deployment

A sample of approximately 2200 schools will be selected for the study and equally distributed across the three groups - two treatment and one control. Once the interventions are designed and developed, they will be deployed for a period of 6 months. Teachers sampled and randomly assigned to two treatment arms will attend an orientation session introducing them to their respective treatment arm's components. These orientation sessions will happen on the same day as the baseline survey. The teachers will receive orientation in batches over a course of 10 days. Following table shows the number of teachers that will be sampled to receive the two interventions in each district.

**Table 13: District-wise Sample Size of Teachers to Receive the Two Treatments**

Treatment Arm	Sitapur	Hardoi
Treatment Arm 1 (Chatbot)	360-365	360-365
Treatment Arm 2 (Micro-practice Videos)	360-365	360-365

**Treatment Arm 1:** Teachers who will complete the baseline survey and consent to participate in the study will be registered as participants. They will receive a demonstration of the chatbot with step-by-step guidance to effectively engage with it and an introduction to its different features. Upon completion of the orientation, registered participants will receive an introductory message from the bot a few days later notifying them of the beginning of their engagement, following which teachers will be able to access daily lesson plans, and maintain a streak as desired.

**Treatment Arm 2:** Teachers completing the baseline survey and consenting to participate in the study will be shown an introductory/trailer video of the micro-practice video series and provided information on the video deployment cycle with videos being released twice every month on the WhatsApp group. They will also be introduced to other components of the treatment arm such as teacher testimonial videos, whatsapp polls, and user demonstration videos.

Upon completion of the introductory session, teachers will be added to their respective WhatsApp groups through which they will regularly receive the content and communication pertaining to the intervention. The Whatsapp groups will be set up at the time of the baseline surveys and in the time between the setting up of the groups and the start of the

intervention, filler content such as introductory messages and introductory video will be posted to keep the participants engaged. A maximum of 15 teachers will be added to each WhatsApp group, with a total of 48-50 whatsapp groups for the treatment. One moderator will be responsible for managing the content and communication on 10 whatsapp groups for the duration of deployment.

The study team will train the moderators on deployment protocols and share a detailed deployment plan clearly stipulating the content to be delivered and its delivery schedule (day/date and time). The moderators will also be trained to monitor engagement, respond to participants' queries, and maintain the group decorum (i.e. refraining participants from sending forwarded messages, unrelated content etc.).

## 8.2 Monitoring Engagement

**Treatment arm 1:** The project team will continuously monitor the engagement data at the backend through a monitoring dashboard. Additionally, classroom observations and phone surveys will also be conducted as part of the monitoring process to track engagement. User activity data will be used to track streaks and send reward/loss-aversion messages accordingly. The table below provides an indicative list of parameters that will be tracked at the backend to monitor engagement.

**Table 14: Monitoring Details for Treatment Arm 1 (Chatbot)**

Chatbot		
Indicator	Parameters	Data source
<b>Level of Engagement with the Intervention</b>	<ul style="list-style-type: none"> <li>No. of teachers engaging with the bot in a day</li> <li>Date &amp; time teachers access the bot</li> <li>No. of clicks in a day by a teacher/How far teachers go in the bot flow</li> <li>Weekly report of inactive users</li> <li>No. of teachers sending videos of themselves implementing activities in classroom</li> </ul>	Whatsapp Bot Dashboard
<b>Level of Engagement with TG</b>	No. of teachers that report using the chatbot as well as TG	Phone Surveys

	No. of teachers observed to be using the chatbot as well as TG	Classroom Observation
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**Treatment arm 2:** The WhatsApp group moderators will be trained to collect and record engagement data which will be verified and checked by the project team regularly. This data will allow the project team to gauge engagement level, implement course-correction strategies if feasible, and keep track of attrition. This will be supplemented by qualitative insights from data collected through classroom observations and phone-surveys on adoption of practices and engagement with the videos. The table below provides an indicative list of parameters that will be tracked to monitor engagement and adoption levels.

**Table 15: Monitoring Details for Treatment Arm 2 (Micro-Practice Videos)**

Micro-practice Videos		
Indicator	Parameters	Data source
Level of Engagement with the Intervention	<ul style="list-style-type: none"> <li>● No. of teachers received/seen/reacted/replied to the videos</li> <li>● No. of teachers received/seen/reacted/replied to the reminder and other messages</li> <li>● No. of teachers responding to the Whatsapp polls on engagement, such as:               <ul style="list-style-type: none"> <li>→ Did you try the strategy shown in the video? [Yes/No/Haven't seen the video yet/Wasn't feasible, tried but too much chaos]</li> <li>→ What was the key message of the video?</li> <li>→ What was the name of the student who answered the question correctly in the video?</li> </ul> </li> <li>● No. of teachers sending queries, feedback, photos related to the intervention</li> </ul>	Whatsapp group backend data to be tracked by moderators

	<ul style="list-style-type: none"> <li>• Type of content shared by the teachers</li> <li>• No. of teachers leaving group, and reason for leaving</li> <li>• No. of teachers who agree to join back and get re-added to the group</li> </ul>	
	No. of teachers that report watching videos	Phone Surveys
<b>Level of Adoption of Micro Practices</b>	<ul style="list-style-type: none"> <li>• No. of teachers sending videos showcasing adoption of practices</li> <li>• Type of videos being shared by the teachers</li> </ul>	Whatsapp Group
	No. of teachers observed adopting the practices	Classroom Observations

Given the field team size of three members and a six-month deployment period, the team arrived at an approximate sample size for classroom observations and phone surveys across the two arms. The sample size is outlined in the table below.

**Table 16: Monitoring Data Sample Size (Approximate)**

Treatment Arm	Classroom Observation	Phone Survey
Treatment Arm 1 (Chatbot)	135	144
Treatment Arm 2 (Micro-practice Videos)	135	144

# Chapter 9

# Conclusion





Through our diagnostic, we identified behavioral and mindset barriers that adversely affect teacher uptake of the features of the NIPUN Mission. Based on our analysis of the diagnostic findings, we have proposed interventions directed towards reducing the complexity of features of the program while being mindful of teachers' cognitive threshold. Effective appreciation and recognition mechanisms have been layered into the interventions, along with the use of existing communication channels to focus on conveying relevant information. We believe this could potentially increase acceptance and uptake of the program, and encourage a shift towards better teaching practices. The intervention design process has been informed by these broad hypotheses.

The team has made sure to undertake a prototyping exercise at each stage of intervention development with a sample from our target audience. Both our treatment arms are geared towards reducing complexity of program features for the teachers while also being mindful of the additive nature of the interventions, and possibly adding to their cognitive load. The aim of the chatbot is to make the teacher guide easier for teachers to digest, and the micro-practice videos are aimed at making new teaching practices introduced in the program easier for teachers to understand and implement. Both treatment arms are based on voluntary engagement and hosted on WhatsApp, which teachers use frequently, and do not require them to access any other platform. A rewards and recognition system has been embedded into each treatment to ensure that teachers are incentivised towards making efforts to engage with the chatbot and the micro-practice videos.

The team has designed rigorous tools and roadmaps for monitoring the interventions throughout the six-month deployment period. The project team will also explore scope for iterations based on the monitoring data. The results from the study will generate valuable insights around the effectiveness and impact of the designed interventions towards increasing teacher uptake of effective practices, and consequently, potentially improving student learning outcomes.

## Supplementary

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### S1. Barrier-Intervention Mapping

The table below presents a mapping of possible mechanisms in the interventions to address a subset of the barriers.

Barrier	Authority	Acceptance	Ability	Affect	Maps to intervention
<b>Status-Quo Bias &amp; IKEA/Ownership Effect</b>	Moderate	Moderate	High	High	(T2) Relatable teacher - so this is not new per se, other teachers are doing it
<b>(Perceived) High initial cost of adoption</b>	Moderate	Moderate	Moderate	Moderate	-
<b>Cognitive Overload</b>	Low	High	High	High	(T2) Focus on one micro-practice a month
<b>Limited User-centricity of TG</b>	Low	High	High	High	(T1) Searchable TG
<b>Blame externalization &amp; Low perceived sense of control</b>	Moderate	Low	Moderate	High	-

<b>towards problem or outcome of actions</b>					
Trust Deficit with Policymakers	Low	Moderate	Low	Moderate	-
Low Sense of Agency	Low	Moderate	Moderate	Moderate	(T1&T2) All interventions are opt-in and they decide to engage with the intervention and the extent to which they want to engage
Cannot Hold Other Stakeholders Accountable	Low	High	Low	Moderate	-
Focus on Compliance	Low	High	Moderate	Moderate	(T1&T2) Less compliance checks, more behavioral reminders and nudges
Lack of resources	Low	High	Low	Moderate	
Technological Challenges	Low	Moderate	Moderate	Moderate	(T1&T2) We use Whatsapp and avoid other platforms/app

					s
Use of heuristics to gauge student levels	Moderate	Low	High	High	(T2) One micro-practice focuses on heuristics to gauge student levels
Perception of Default Learning	Moderate	Low	Moderate	High	-
Belief that class preparation is not important	Moderate	Low	Moderate	High	(T1) Easy access to TG and reduced time and effort for prep (preping may in turn change belief)
<b>Limited know-how/Communication Gap</b>	Moderate	Moderate	High	High	(T1&T2) Pedagogical practices through videos. Lesson plans in a easily digestible fashion
<b>Sub-optimal quality of training</b>	Low	Moderate	High	High	(T2) Break down the teaching practices and make it easy

<b>Information Overload</b>	Low	Moderate	Moderate	Moderate	(T2) Lower frequency of content. One new method per month
<b>Loss of relevant information</b>	Low	Moderate	High	Moderate	(T2) the micropractice is reiterated with steps on screen and infographics
Lack of Appreciation/Support from Community and Parents	Low	High	Moderate	Moderate	-
Ineffective Support System	Low	Moderate	Moderate	Moderate	-