Program to Improve Private Early Education (PIPE): a case study of a systems approach for scaling quality early education solutions

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FSG is a mission-driven nonprofit organization supporting leaders in creating large-scale, lasting social change. A survey conducted by FSG in 2015 across 4407 low-income families in urban India showed that 95% of them send their children to preschools, a majority of choosing affordable private preschools (APSs), as parents perceive the quality of government schools to be poor. Parents use and value rote-based methods (e.g., reciting poems) to assess their children’s learning in school; however, these methods fail to measure conceptual understanding. The APS system delivers on these rote approaches using inappropriate pedagogy, leading to poor learning outcomes. Affordable high-quality activity-based preschool solutions exist and could be brought to the APS to significantly improve the classroom environment and learning outcomes. This requires changing mindsets of all actors—solution provider companies, APS owners, APS teachers, and low-income parents. We present FSG’s approach to shaping demand for quality preschool services and to improve learning outcomes in urban Indian APSs through the implementation of the pilot Program to Improve Private Early Education (PIPE).

Keywords: preschool; activity-based learning; affordable private schools; market-based solutions; India

Introduction

The UNICEF website describes early childhood care and education (ECCE) as “the most cost-effective and efficient investment to start a lifelong path of learning and to ensure all children have a fair chance to reach their potential.”

Organizations such as the World Bank have published numerous examples of impact of ECCE from across the world; for example, in Bangladesh, children who received some form of organized intervention outperformed peers in a control group by 58% on a standardized test for school readiness.

Globally, while enrollment in preprimary education, a strategy for providing ECCE, has increased in the past decade, more than half of all 3–6 years old still do not have access to preprimary education. According to the UNICEF website, “only 25% of children in countries studied are developmentally on track in reading and math, which dampens their prospects for school success,” which is largely due to a lack of investment by governments in low- and middle-income countries in preprimary education.

In India, while the importance of early childhood is recognized, the 86th amendment to the Constitution in 2001 which made education a fundamental right for children aged 6–14 years delinked ECCE from this commitment. ECCE is now considered a constitutional provision and not a justifiable right.

However, as a significant support for child development and education, the Ministry of Women and Child Development, India, has recently formulated a draft policy on ECCE, which is under due process. The central government also adopted a National Early Childhood Care and Education policy in 2013 (see Ref. 5); however, this policy saw little implementation on the ground as there were no laws compelling adherence to the policy.

In India, there is a high demand for affordable private preschools (APSs). A study published by the
Center for Civil Society found that over 75% of parents who had chosen private schools had done so because they believed the quality of private schools to be superior; and 15% had done so because English was the medium of instruction in private schools. This finding is supported by other studies on the growth in demand for affordable private education in India.7–9

Unfortunately, despite the motivations of parents and their investments, students’ learning outcomes remain poor. An assessment conducted in three Indian states found that only 35% of 9th and 10th graders were able to read at a level expected of a fourth grader, and that learning outcomes were poor in both government and affordable private schools.10 Research by FSG with 480 children in kindergarten and grade one in four cities (a baseline study using IDELA) found that over 54% of children entering first grade in urban affordable private school APSs could not pick out the correct number of objects corresponding to numbers from 10–20 (e.g., picking 13 pencils from a stack of 20); and 78% of children could not read three simple three-letter words (e.g., sat, pin, and bat). Affordable private schools for the scope of this work are defined as private schools charging a monthly tuition of under INR 1500 (US$23).

The importance of the gap in early learning is highlighted by the Indian Early Childhood Education Impact Study (IECEI), which found that children in the top-quartile in school readiness assessments at 5 years of age outperformed those in the bottom quartile at 8 years of age in both language and mathematics tasks. The study also found that “on average, children's school readiness levels at five years old were far below expected levels [. . .] Children thus enter school unequipped with the cognitive, pre-literacy, and pre-numeracy skills and conceptual understanding to meet the demands of the primary school curriculum.”11

The quality of preschool education in APS is particularly important because low-income families are overwhelmingly choosing an APS, foregoing government options or smaller standalone preschool providers who do not offer grades beyond kindergarten. It is critical, therefore, to focus on improving the quality of ECE provision by an APS. One approach to improving the quality of ECE provision is through bringing in good preschool interventions or products that can improve the teaching learning process in APS. High-quality solutions already exist in India. By “solutions,” we refer to end-to-end packages that provide schools with the curriculum, teacher training, on-going support, and teaching-learning materials required to deliver preschooling; by “high-quality,” we refer to solutions that provide activity-based learning (ABL). Bringing these solutions into APS could prove transformational for learning outcomes. They would mean a sea-change away from traditional rote learning and direct efforts on the group that requires the greatest support: low-income children.

Low-income parents are already investing in preschool education and enrolling their children in APS. There is a huge opportunity to transform their learning outcomes by replacing rote learning with ABL in APS classrooms across urban India. In 2014, FSG, a nongovernment organization, launched the Program to Improve Private Early Education (PIPE): a 6-year initiative that aims to improve learning outcomes for over 200,000 low-income children in India annually, and set the urban APS market on the path to transforming learning outcomes for children from all urban working poor households. PIPE’s focus has been on adopting and adapting education solutions with developmental impact, and delivering them to the millions of children whose lives they could help transform. The activity-based solution partners were selected from an initial list of over a hundred solution providers based on criteria such as focus on preschool, developmental appropriateness, ABL, willingness to partner, and ability to scale. PIPE is currently in its third year of operation and at a stage where it has a refined theory of change (ToC) and is piloting its approach in preparation to scale.

This paper presents FSG’s approach to address the challenge of poor learning outcomes in urban India by leveraging existing desires and motivations of the various actors (including parents, APS owners, and solution providers) in the system. The paper also provides insights on how to design both an overall program and market-based education solutions in order to achieve impact at scale. It draws primarily on research using PIPE and the learning and insight from the FSG team on the ground.

**Methods**

The research with low-income parents cited in this article was carried out to understand the behaviors
and beliefs of low-income parents regarding their child’s ECCE. The research investigated the complete “buying process” for preschool including demand origination, demand activation, information gathering, selection, purchase and payment, and postpurchase behavior. The questionnaires used for the research are available online at http://www.fsg.org/PIPE.

For the purposes of this research, we defined early childhood as the ages 2 through 5 years, although early childhood is typically considered to range from the ages 0 to 6. This narrower definition was chosen to reflect interest in the years when formal preschool services are typically provided in India.

The research employed both quantitative and qualitative techniques. The approach used to identify low-income households differed between the qualitative and quantitative research, and those differences and rationales are detailed below. Data for the qualitative research were collected in April and May 2015. Data for the quantitative research were collected in the months of June and July 2015. During this period, children attending ECCE were either in academic year 2015–2016, or on summer break, having completed academic year 2014–2015. For consistency, we report the child’s age at the start of the academic year that we interviewed the parents.

Qualitative research
The primary objective of the qualitative research was to gain a holistic and deep understanding of parents’ beliefs and behavior with regard to their child’s ECE, through interviews. Key insights gained through the qualitative research were investigated through the quantitative research.

The qualitative research covered 108 parents from low-income households across three cities (Rajkot, Hyderabad, and Kolkata), with a child between the ages of 2 and 5 years who was enrolled in an ECCE program outside the home. Low-income households were defined as households with self-reported monthly household incomes of between INR10,000 (US$154) and INR25,000 (US$385). A nonrandom sample of respondents was recruited from low-income neighborhoods through a market research agency.

The qualitative research consisted of in-depth family interviews as well as focus-group discussions. In-depth interviews were conducted with both parents present, at their residence. Four in-depth interviews were conducted in each of the three cities. In each city, two of the in-depth interviews were conducted with households earning between INR10,000 and 15,000 per month and the remaining two with households earning between INR20,000 and 25,000 per month. Focus-group discussions were held with mothers and fathers separately and conducted outside parents’ residences. Four focus group discussions were conducted in each city—two groups with mothers and two groups with fathers. In each city, one of the groups with mothers and one of the groups with fathers consisted of individuals from households earning monthly incomes between INR10,000 and 15,000 per month. The remaining groups consisted of individuals from households earning between INR20,000 and 25,000 per month. The interviews and focus group discussions (FGDs) explored parental beliefs and behaviors pertaining to ECE and, their current purchasing behavior and spending patterns pertaining to ECE.

Quantitative research
The objectives of the quantitative research were to further test and quantify a subset of insights obtained from the qualitative research, and size the market for affordable ECCE in urban India, defined as spending by low-income households on preprimary education.

The study was conducted with 4299 parents from low-income households—defined as households falling into the socioeconomic classes of D1–A3 as per the New Consumer Classification System (NCCS)—with at least one child who had completed a second birthday but not yet reached age 6. The research was carried out across eight cities, five of which had populations greater than 5 million people (Ahmedabad, Delhi, Hyderabad, Mumbai, and Kolkata) and three with populations between 1 and 2.5 million (Coimbatore, Nagpur, and Rajkot).

The quantitative research consisted of two different types of interviews—a shorter “listing” interview with all 4299 parents and a longer “structured” interview with a subset of 2010 parents. The listing interviews were brief interviews with a larger sample of households compared to the structured interviews, with the objective of collecting data on the following key areas:

- Prevalence of ECE (whether children were attending an ECCE program outside home).
- Financial investment in ECCE by households (fee paid to preschool provider).
- Type of ECCE being accessed by target households (private or public).
- Socioeconomic classification data (self-reported income, occupation, and other demographic details).

The structured interviews were more extensive interviews conducted with a subset of parents who were included in the listing interviews. These were designed to collect quantitative data on insights from qualitative interviews relating to the following areas:

- Home environment
- Beliefs around early childhood education and development
- Purchasing behavior (how parents choose a preschool provider)
- Expectations and monitoring behavior once the child is enrolled in a preprimary class
- Interactions with the preschool provider

Structured interviews were conducted with those households from the listing interviews that met three additional inclusion criteria:

- Had at least one child who had turned 3 but not yet reached 6 years of age;
- The child had accessed ECE outside the home for at least 8 months;
- And the monthly fee to the preschool provider for the child was between INR 300 and 1200 ($5–$18).

The additional inclusion criteria were to ensure that interviewees had adequate experience engaging with their child’s preschool provider and therefore could provide richer data relative to parents who had not yet interacted with a preschool provider over a significant period of time. The fee criteria allowed the research to focus on beliefs and behaviors of parents who were already spending above a minimum threshold on ECCE—and therefore made questions about buying behavior more pertinent to them—but not beyond what could typically be expected of a low-income family.

**Sampling technique.** A quota was set for the number of households from each NCCS class in the listing interviews. The NCCS is used to classify households into socioeconomic classes based on two variables: education level of the chief wage earner and number of consumer durable goods owned by the household from a predefined list of 11 durables (http://www.mruc.net/?q=new-consumer-classification-system-nccs). The rationale for using NCCS class in place of household income for the quantitative research was based on the absence of data on the distribution of households by income in urban India, which meant findings from the research could not be extrapolated to the larger population, as we could not determine what proportion of the total population our target segment represented. Additionally, it addressed the issue of biases in self-reported incomes by households, which are typically downward biases where households tend to underreport incomes. Our research shows that NCCS classes are correlated to self-reported household incomes; with our lowest target NCCS class (D1) having an average self-reported monthly household income of INR8352 ($128) and our highest target NCCS class self-reports an average monthly household income of INR18,127 ($279). All household incomes reported in this white paper have been adjusted by 10% to account for a downward bias in self-reported incomes; for example, INR 8352 is reported as INR9187.

The quota was in proportion to the actual distribution of households in the target cities (as per the Indian Readership Survey 2014), resulting in a self-weighted sample. A random sample of target households was then selected as follows. Neighborhoods were selected in a random manner in each target city from a list that excluded “outlier” neighborhoods that were preidentified as either the wealthiest or poorest neighborhoods in the city based on previous field knowledge. Using a municipal list of households in these localities, 50 starting addresses were identified using systematic, circular, random-sampling methods. Starting from the first household thus identified, listing interviews were conducted with 10 households around each starting address. Structured interviews were conducted with eligible respondents from the listing interviews. Additional interviews were conducted where required, in order to get enough eligible respondents to meet the sampling quota for the various NCCS classes while still ensuring randomness of the recruited households.
Analysis. The following definitions were applied for our statistical analysis:

- Weighting the sample by age. In some cases, the sample has been weighted by age to account for the unequal numbers of children in each age group in our sample. The key questions weighted by age are (1) proportion of children attending preschool, and (2) type of preschool provider (i.e., private or government) being accessed by the children.

- Trimmed averages. All average figures reported are trimmed averages, that is, where the top and bottom 5% of values have been eliminated before averaging the data. The exception to this is data on income by NCCS class.

- Calculating share of children from low-income, urban households attending APS. The reported share of children from low-income, urban households attending APS is based on findings from the quantitative research that 95% of all 4- and 5-year-old children from low-income households are enrolled, and 90% of them are going to a private provider (either an APS or a standalone preschool provider). The resulting 86% figure is based on two assumptions:
  o The 74% who are already enrolled in an APS at ages 4 and 5 years will not be switched out from the APS into a government school as they enter first grade.
  o The 12% who are enrolled at a private standalone provider at ages 4 and 5 years will proceed onto an APS rather than switch into the government system.

The rationale for the two assumptions is as follows: (1) parents of children who are currently enrolled with a private preschool provider are those who can afford private provision; (2) parents perceive private schools (not just at the preprimary level) to be of superior quality compared to government schools (as explained below); and (3) parents seek out quality in education and generally want to get the “best possible” education for their child (as explained below). The 86% figure may include children attending a more expensive private school under the Right to Education Act. It also includes 6% paying fees of between INR1500 and 2000; and 3% paying over INR2000.

In addition to the customer research described above, PIPE actively interviewed and interacted with 28 owners/principals across three cities (Bangalore, Delhi, and Hyderabad) in 2015. The objective of this piece of research was to better understand the Indian APS market and more specifically the APS owners’ buying motivations and processes for “nontraditional” purchases (i.e., purchases not uniformly made across schools, especially those linked to improvements in quality). Additionally, the research sought to better understand implementation and other key challenges faced by the APS.

Results of household survey

The following sections present findings from the study as well as the program’s ToC and proposed solution. The survey of 4407 households revealed high levels of enrollment private preschools, and significant expenditure on early education among low-income, urban families:

- Ninety-five percent of low-income households—low-income households constitute 70% of urban India and have enrolled their 2–6 years old children at a preschool provider. Low-income households are defined as households belonging to socioeconomic classes D1–A3 under the NCCS. Children were attending preprimary classes in a formal setting with a defined educational curriculum. They were at the preschool provider for an average of 4.4 h a day, at least 5 days a week. These high rates of enrollment in “formal, especially in a context where the state does not legally require it”—indicate that low-income parents value and consider it an important experience for their child (see Fig. 1, showing the prevalence of private schooling by socioeconomic class).

- Low-income families were investing an average of about 6% of household income on their child’s preschool education. This expenditure reflects an overwhelming preference for private education: 87% of parents had chosen a private provider, rather than opting for free public options as they believed that private provisions would give access to better quality education.

The main motivation behind preschool enrollment is to help improve the child’s future academic prospects. When asked why they had enrolled their
child in preprimary classes, the response by 90% of parents related to academics—this motivation was the same across all income levels. Parents overwhelmingly see preschool as crucial groundwork required before entering first grade. It was seen as helping the child:

- Learn basic academic skills: 66% of parents reported that they had enrolled their child in preprimary classes because it would help teach them the basic academic concepts and skills required in grade school,
- Developing habits required in grade school: This was the first reason stated for preprimary enrollment by a quarter of parents, and 65% of parents included this as one of several reasons. Parents believe that children need to form certain habits in order to succeed in grade school, including: doing homework, taking tests, being away from home, and sitting quietly in a classroom.

Peer pressure also plays a significant role in the decision to enroll children in preprimary classes. Nearly a third of parents reported that one of the reasons for preprimary enrollment was that most other children of a similar age in the neighborhood were also enrolled (see Fig. 2, showing the reason for preschool enrollment).

FSG’s work with low-income families over the past decade strongly suggests that low-income parents want their children to be able to secure aspirational white-collar jobs—education is seen as the means by which these jobs can be secured, and English and mathematics in particular are seen as essential skills. The motivation for enrollment in, and expenditure on, is best understood through this lens of parents investing in the future that they wish for their child.

Parents were also extremely satisfied with the preschool provision that their child was receiving. Only 4% of parents had switched preschool providers because they were dissatisfied. In fact, satisfaction rates with the current preschool provider were well over 90% across five different aspects of quality and performance, and 99% for quality of education (see Fig. 3, showing satisfaction with current preschool provider).

Urban, low-income parents have many choices when selecting a preschool provider for their child. Most dense, low-income communities have 30–40 APSs within a 2-km radius. Ninety percent of parents reported the quality of the preschool provider as a reason for selecting the preschool for their child. This makes the market highly competitive. However, there are no formal certification systems or rating systems, either by the government or private entities. Parents must instead rely on a variety of methods
to form an opinion about the quality of preschool providers. Word-of-mouth recommendations and the school’s reputation for quality were the primary drivers behind 92% of parents’ choice of provider. The strength of these two factors was further highlighted by the finding that 90% of parents had not visited more than two providers before enrolling their child. This strongly suggests that parents use recommendations and local reputation to narrow down their list of options (see Fig. 4 showing information that most influenced choice of preschool provider).

For parents, the perceived academic performance of past graduates and current students is incredibly influential and is one of the most important contributors to a provider’s reputation. Schools widely advertise their 10th- and 12th-grade students’ board examination results (similar to GCSEs or international baccalaureate; typically conducted by government state-level boards for the low-income segments) to signal their academic quality to parents. Parents also use grades of current students and other signs that are closely related to certain highly valued skills such as English and mathematics: does my neighbor’s child who goes to this school speak a lot of English words/poems? If he does, then the school must be teaching him well.

In addition to academic outcomes, parents also look at the infrastructure of the school (e.g., does the building have a fresh coat of paint); the presence of technology-enabled products, such as computers and smartboards; and security measures, such as whether a guard is stationed at the school.

Given the highly competitive nature of the market, APSs therefore differentiate based on infrastructure and not on what parents actually care about: children learning the skills to succeed academically and professionally. APSs, for example, invest in technology-enabled products such as smartboards that can signal good infrastructure, but do not necessarily follow-through to ensure that the technology is used effectively inside the classroom to support learning. The survey findings informed the development of the PIPE strategy.

**Program to Improve Private Early Education**

There are barriers on both the demand and supply sides to realizing the potential of high quality in order to achieve sustainable impact at scale. PIPE works to address both these sides of the market.
Problems on the demand side

PIPE addresses two key problems relating to demand for ABL that can deliver both conceptual learning and broader development benefits:

- Parents use the “wrong” markers to test whether their child is learning.
- Parents have no way of distinguishing high-quality preschool providers from others.

Parents care deeply about education and expect to teach their children the academic skills (especially English and mathematics) and habits necessary for future academic success. The problem, however, is that parents are currently using the “wrong” markers to test whether the child is actually learning. By “wrong” markers, we are referring to markers that do not test whether the child has actually learned the concept but rather test whether the child has rote-learned and memorized the content. For example, parents check whether children can recite English alphabets, phrases, and poems, but not whether they can read new words or apply the phrases they are reciting in conversation. With mathematics, parents use markers such as whether children can recite up to 50 or fill out the number two when presented with one plus one; rather than whether they can pick out 12 from a stack of 20 or point out that 6 is a larger number than 3. There is a crucial gap between what parents expect their children to learn and the markers they are using to check whether children are actually learning.

This leads to a dynamic where APSs (and other private preschool providers) are able to use rote learning approaches in order to keep parents satisfied, despite not delivering conceptual learning. Preprimary classes at private providers are designed to address the wrong markers that parents currently use, with class time filled predominantly by activities such as repetitive recitation of poems and English phrases or copying down numbers from the blackboard. The right markers that would test whether the child has learned the actual concept—such as whether the child understands the cardinal value of a number—are largely unaddressed in these classrooms because parents do not currently look for them, and teachers do not know how to teach them.

Most children at APSs would not do well if parents used markers that assessed conceptual learning. We found that over 54% of children entering first grade in APSs could not pick out the correct number of objects corresponding to numbers from 10 to 20 (e.g., selecting 12 pencils from a stack of 20), and 78% of children could not read three simple three-letter words. This is based on testing of 254 first-grade students at APSs and government schools, using an adapted IDELA tool (separate from the research on which this white paper is based; details are available at http://www.fsg.org/PIPE). Given that preschool providers deliver on the wrong markers, parents were overwhelmingly satisfied with the preschool they had chosen. Unless parents...
can recognize the right markers, they will continue receive poor-quality ECCE. Once they begin to value the right markers, schools will need to meet the demand by providing better quality ECCE that leads to real learning.

**Problems on the supply side**

As described earlier, high-quality preschool solutions (i.e., solutions that can effectively deliver ABL in classrooms) already exist in the mid- and upper-end of the private school market. The challenge is getting them to reach low-income children in APSs. PIPE addresses two key problems on the supply side:

- Solution providers are skeptical of the APS opportunity.
- Solution providers and their solutions require adaptation for the APS market.

**Solution providers skeptical of the APS opportunity.** The PIPE program scanned over 160 different solution providers in the Indian market. Common perceptions among many of these providers were that APSs would not be interested in their solutions because their benefits are harder to immediately make visible to parents—a smartboard can be marketed relatively easily as better infrastructure, whereas the value of a solution that improves conceptual learning through activities may not be as easy to communicate to parents. They also believed that many APSs would not be able to afford their solution and that they could not therefore justify additional efforts to sell into the APS market.

**Adaptations are required for the APS market.** There are several practicalities and nuances of the APS market (beyond the obvious relatively lower capacity to pay) which make it significantly different for a solution provider. These include aspects such as:

- Purchase decisions at APSs are made by owners who often have little or no formal training as an educator.
- APS owners may not be familiar with approaches to convince parents of the benefits of ABL.
- APS parents, owners, and teachers are less likely to be aware of ABL or its benefits.
- APS teachers, particularly at preprimary grades, have little or no formal training in early education, and sometimes even in teaching.
- APS classrooms are extremely constrained for space, making ABL difficult to implement without customization.
- Students at APSs come from home environments where they have little to no exposure to English.
• APSs are likely to face infrastructure issues such as regular power outages or a lack of equipment such as televisions or speakers.

This nonexhaustive list of peculiarities and limitations that are realities of the Indian APS context provide a flavor of the adaptations required to both the processes and systems of the solution provider, as well as the solution itself. PIPE’s extensive work with eight solution providers serving the mid- and upper-end of the market has brought many of these required adaptations into sharp focus. For example, a training that works well for well-qualified teachers may not work with an APS teacher who has only completed secondary schooling; the sales pitch for an activity-based solution to an APS owner who has not come across the approach will have to be different from the pitch to a principal who is an experienced educator.

The PIPE solution

PIPE seeks to address both the demand and supply-side problems described above in order to facilitate the spread of ABL to APSs across urban India. Before detailing the precise solution developed by PIPE, it is worth considering why PIPE chose to focus on ABL in particular. The first consideration is that there is considerable consensus within the education field that ABL has powerful impact both in terms of helping children learn concepts as well as providing a wider range of early development benefits across domains including socio-emotional, physical, and cognitive. The other factor is the appeal of the approach. ABL can help children learn skills that parents already value, including in areas such as English and mathematics. For PIPE, ABL is therefore something that parents will value and demand, provided that they are able to recognize its benefits. This obviates the need for parents to fundamentally shift their beliefs and motivations around what skills their children should be learning in preschool.

A key principle of PIPE’s approach is to leverage existing desires and motivations of the various actors in the system (or, in other words to shape demand for quality preschool services). This is borne out of the belief that interventions which appeal to existing incentives are much more likely to succeed than those which require actors to radically shift their perceptions on what is in their best interest. Figure 5 details the incentives of key actors in the system.

The “right” marker is a means of stimulating demand for ABL. PIPE is working to inform parents about the “right” markers they can use to assess whether their children are actually learning the concepts that would allow them to succeed in grade school and beyond. Unlike the wrong markers (which test memorization of content), the right markers can intuitively demonstrate to a parent that the child has actually learned a concept, without requiring the parent to have a broader understanding of early education; for example, asking a child to pick out 12 sticks from a stack of 20 (rather than simply reciting numbers up to 50) can show a parent that the child actually understands the cardinal value of the number. Similarly, asking children to read new three-letter words can show parents the child has learned to read rather than just recognize familiar words. The shift from wrong to right markers is one of the lynchpins of the program. The right markers are important because once parents begin using them, their demands and expectations can no longer be met through rote learning. This is because rote learning cannot teach children concepts, which is what the right markers look for. APSs will therefore have to adopt ABL that can actually teach concepts in order to satisfy parents who are using the right markers.

APSs are likely to adopt ABL in order to maintain their reputation in the market and continue to attract students. This is because, as described earlier, the APS market is highly competitive and parents will choose the APS which caters to their expectations. The right markers can therefore drive what happens in APS classrooms.

To this end, the PIPE team has been working to identify the right markers, by developing and piloting a number of different markers with students and parents at APSs. We see two key strengths in an approach that focuses on the right markers from a scale and practicality perspective:

• They are easy to communicate and understand. This makes it easier to effectively scale the intervention, rather than an approach that would have required sharing detailed and complicated information about early education or development with parents at scale.
• They do not require parents to change what they value. Because the right markers can only be addressed through ABL, we are able to
stimulate demand for it without parents having to understand or equally value the broader development benefits ABL provides in areas such as socioemotional development or executive function.

**Spreading the right markers**

PIPE’s approach is to have APSs be the initial channel through which parents are informed about the right markers. We believe this is possible (and likely to succeed) because it is in the APSs’ interest to signal that they are delivering conceptual learning—and informing parents about the right markers allows them to do so. This allows them to differentiate themselves in a highly competitive market. APSs will, however, require support, especially in the early stages, with communicating the right markers to parents. An ideal partner to provide this support is the solution provider delivering ABL because they have an incentive to ensure that APSs are able to communicate the benefits of their solution to parents—it is a means of ensuring their customer sees value in their offering. PIPE is working with solution providers to develop “parent engagement” modules as part of their overall solution so that APSs can be supported in effectively communicating the right markers (and the benefits of the solution) to parents.

Once an initial set of parents are informed by early adopter APSs, word-of-mouth between parents will ensure that information about the right markers spreads to much greater number of parents. Word-of-mouth is incredibly powerful in this market: for 92% of parents, the choice of preschool provider was most influenced by word-of-mouth recommendations and the school’s reputation for quality. The key role played by word-of-mouth in scaling not only the right markers but also ABL is detailed further in the section below. Incidentally, the right markers also address the second problem on the demand side: lack of quality certification/assessment mechanisms that help parents distinguish high-quality preschool providers from others. The right markers can serve as the test of quality: preschool providers and solution providers that deliver conceptual learning can be identified by the fact that their students perform well against the right markers.

**Creating supply**

Alongside shaping demand toward ABL, PIPE is working to ensure that there are solution providers that can serve the APS market effectively at scale in a sustainable manner. In order to address the supply-side problems of (1) skepticism about the opportunity among solution providers and (2) adaptations required to serve the APS market, PIPE has adopted a four-step approach:

1. **Scan the market.** The purpose of this scan was twofold: (1) verify whether high-quality...
solutions already existed and (2) identify organizations that could become partners for the program. PIPE identified and scanned over 160 organizations that were already delivering high-quality preschool solutions in various settings in India. These included organizations that were serving the upper-end of the private school market, those focusing on the government system, and those that were delivering through their own schools. During the scan, PIPE assessed the solutions offered by each organization across a range of dimensions including:

- Impact from a developmental perspective.
- Potential appeal to parents.
- Potential appeal to APS owners.
- Potential to deliver the solution at a price point affordable for APSs.

The scan resulted in a shortlist of organizations that PIPE engaged further in order to address the issues of skepticism and adaptation.

(2) Convince solution providers of the opportunity. As described earlier, a key challenge on the supply side is the issue with solution providers being skeptical of the opportunity to serve the APS market in an effective and sustainable manner. In order to illustrate the opportunity, PIPE undertook the following work with shortlisted organizations:

- Presenting data. PIPE gathered and presented data which helped demonstrate demand and an ability to pay for high-quality preschool solutions among APSs, provided that the solution was something that appealed to parents. In addition to the interviews with over 4400 parents described earlier, PIPE also undertook research with 28 APSs and several solution providers to gather these data. The evidence that was presented to potential partners showed that:
  - Parents at APSs are able and willing to pay for quality education:
    - Parents are spending around 6% of household income on preschool for each child.
    - Parents value solutions that provide key skills such as English and mathematics.
  - APSs are profitable and are already spending on products and services to differentiate themselves in the market:
    - Successful APSs can make profits exceeding US$25,000 per year.
    - APSs already routinely purchase products and services costing several thousands of dollars (such as smartboards, abacus math classes, and building improvements) that can help differentiate them in the market.
  - The market opportunity is large:
    - Seventy percent of all urban households are what we term low-income.
    - Eighty-six percent of low-income households are sending their children to APSs.
    - The APS market consisting of approximately between 130,000 and 160,000 schools is a large segment that is currently underserved.

- Showing-by-doing. Despite the data, more practical demonstrations are often necessary to convince partners that a real opportunity exists. To this end, PIPE team members sold solutions offered by potential partners to APSs. This involved identifying APSs in target cities and delivering an initial sales pitch to APS owners. The solution providers were then connected to interested APS owners to close out the sale. PIPE team members remained involved in the sales process, advising the solution provider on how to position their solution and its benefits. PIPE was able to sell to 5–10 APSs on behalf of solution providers, further demonstrating the potential in the APS market.

Through the process of scanning the market and illustrating the opportunity, PIPE has established partnerships with seven organizations that are...
interested in, and have the potential to, scale effectively in the APS market with high-quality preschool solutions. See Figure 6 showing handouts to APS owners explaining the benefits of an ABL solution.

(3) *Learn together what it takes to deliver effectively.* The peculiarities of the APS market require both the solution provider and the solution to adapt in order to be effective. The precise adaptations required can only be learned through a process of action research where pilots allow for solutions to be tested in a live setting. To this end, the PIPE team has been deeply involved in delivering solutions inside APSs alongside partner organizations. This has included taking the lead in arranging logistics (such as for teacher trainings), engaging with owners and parents to understand how they perceive the solution, conducting regular observations at pilot schools, and providing quick feedback and support to partners to ensure the solution is delivered effectively.

(4) *Configure the solution provider for success.* Based on the action research and through pilots, PIPE is able to help partners adapt their internal structure as well as their solution for success in the APS market. This involves providing advice and then supporting the partner through the process of change. For example, the PIPE team:

- Helped a partner develop a new business vertical dedicated to serving the APS market. This involved helping them think through the team required, the recruitment process, and internal processes to ensure effective integration.
- Supported partners in refining their overall business model, including: identifying key parameters for success (e.g., customer acquisition and renewals) and then optimizing the business model for these parameters (e.g., strategies to ensure high renewal rates); changing the sales process and pricing strategy; and adapting the design of teacher trainings to address high rates of teacher attrition in APSs.

| Benefits of the program | Tips for Supporting Teachers |
|-------------------------|------------------------------|
| 1. Students will be able to read full sentences on their own by the end of Sr. KG e.g., My mug is red and it has hot water in it. | **1. BEING PREPARED FOR CLASS:** Please ensure teachers spend 1–2 h of planning time in a week, going over lesson plans together, clarifying doubts over a call with the trainer, practicing the English sounds, and getting the materials ready. |
| 2. Students will improve at spelling difficult words, and be able to read them independently e.g., rabbit, bathtub, laboratory, chocolate, etc. | **2. COMPLETING THE SYLLABUS:** Please check-in with your teachers once in 2 weeks to see if they are progressing on the session plan as per the expectations. Please refer to page ____ of the manual for the syllabus, and to know what the ideal completion for each month. |
| 3. Children will be able to recognize sounds in words and begin reading unfamiliar words. e.g., Recognize sounds in “bring” (br-i-ng), “Maharashtra” (Ma-ha-rash-tra), “stench” (st-en-ch) | **3. FOLLOWING THE LESSON PLAN:** Using the observation checklist on page ____ of the manual, please visit your teachers’ classrooms once a month to ensure they are following the instructions in the teacher manual. Please reach out to your school’s Relationship Manager if you have concerns. |
| 4. The speed and accuracy of your child’s reading will improve, getting them ready for first standard. This means they will be able to read their textbooks more correctly and with greater speed than if they did not have phonics. | **4. RESOURCES AND SPACE:** Please ensure that teachers have access to the resources they need to successfully implement “Fun with Phonics.” Please refer to page ____ of the manual for a list of all the material/teachers will require to conduct the activities. Please support teachers if they need to move furniture around, take children outdoors, or use the A/V system. |
• Supported partners in customizing solutions so that they use easily available materials; are easy to delivery in the physical setting of an APS; and can be effectively delivered by a relatively untrained teacher.

• Learned from teacher feedback that the partner’s approach of supervision visits once a quarter was insufficient. The team is now working to refine the partner’s business model to allow for more frequent supervision and support.

The PIPE theory of change (ToC)

PIPE has always been focused on creating sustainable impact at scale. The PIPE ToC focuses on leveraging existing motivations because that can allow for the solution to scale in a sustainable manner. Figure 7 illustrates PIPE’s ToC. The ToC focuses on three key actors in the system with the following incentives:

• **Parents** who want their children to learn better (i.e., receive conceptual learning) AND do not want their children to fall behind their peers.

• **APS owners** who want to improve (or at least maintain) their reputation in a competitive market.

• **Solution providers** who see the APS market as a large business opportunity.

Solution providers see the APS market as a large, profitable business opportunity and sell activity based to APSs. These are solutions that provide conceptual learning in areas that are valued by parents (e.g., English and mathematics), while also providing broader development benefits. APSs will buy these solutions because they recognize that parents will value the conceptual learning they provide, and that this in turn will help improve the APS’s reputation in the market as a provider of good-quality education.

To ensure its reputation is improved, the APS will educate parents about how the school is now providing conceptual learning by using the solution provider, and not just traditional rote learning. The APS will communicate the change by using the right markers to intuitively demonstrate the difference between conceptual and rote learning and illustrate the improved learning of the child.

Parents will assess their children using the right markers and see that their child is now learning actual concepts and not just rote learning and memorizing content. They will then talk to parents at other APSs about how their child’s conceptual learning has improved (and that they used the
right markers to assess this) and that their APS has used the solution provider to achieve this improvement news of the right markers and the solutions spread through word-of-mouth. Parents at other APSs will also use them and find their children are not learning concepts. These parents will not want their children to be left behind, and will demand their APS also teach the concepts tested by the right markers.

Other APSs will not want to be seen as providing inferior quality—they will want to maintain their reputation in the market, and will buy activity-based solutions from the solution provider (or another similar solution provider), since they will not be able to meet parent demand for conceptual learning through current rote learning approaches. This will lead to activity-based solution providers serving other APSs beyond the initial customer APSs, setting in place a virtuous cycle that spreads activity-based solutions: parents at these other APSs will also be informed about conceptual learning (versus rote learning) using the right markers. More and more parents will begin talking about conceptual learning and the right markers, reinforcing and spreading demand for the solution provider (and for similar solutions that provide conceptual learning).

Once a critical mass of parents become aware of the right markers and therefore begin demanding conceptual learning, the broader market will have to shift toward ABL because there will be no other way to meet parent demand that is now shaped by the right markers. Solution providers will be keen to sell and serve APSs and scale their business. Through this approach, therefore, PIPE can achieve scale in a manner that does not require ongoing efforts from the Program.

The key engine of change through which PIPE will influence the system toward impact at scale are the solution providers. The journey to scale with each partner solution provider (once they have been configured for success as described above) will involve much more customized support including elements such as: developing a dedicated brand for the APS market, raising capital for scaling, and developing and managing growth plans. The program also anticipates having to address certain barriers to scale that are common across partners (e.g., working with governments to address regulatory barriers and refining markers to ensure effectiveness with low-income parents).

**Impact**

PIPE’s mission is to transform early learning outcomes for low-income children across urban India. The program recognizes that this entails a journey that requires several elements within the system to be addressed before the final desired outcome can be realized. The journey begins with children simply having access to schooling, and then moves to ensuring that schools provide ABL, before addressing the actual quality of the ABL being delivered. The final outcome of improved learning outcomes will also likely need to be preceded by changes in the child’s home environment. The program’s conceptualization of this journey toward improved learning outcomes is illustrated in Figure 8.
PIPE’s research indicates that the first step on this journey has largely been addressed: over 90% of 4- and 5-year olds in urban India are already enrolled in preschool. The program’s impact targets therefore focus on the next four steps of the journey, and on what can be achieved (and measured) during the life of the program by 2020:

- One hundred twenty-five APSs have bought solutions that deliver ABL, and are delivering it regularly and adequately.
- Three hundred fifty teachers are trained and capable of delivering ABL.
- One hundred twenty-five APS owners are aware of ABL and are monitoring its adequate delivery in their classrooms.
- Twelve thousand parents are informed about the right markers to assess conceptual learning.
- A minimum of 12,000 children benefit from ABL and have improved early learning outcomes.

Beyond the life of the program, the expectation is that the broader APS market will have been set on a path to transformation in the manner described in the previous section. The vision is for the 9 million plus low-income children being served by the urban APS market to therefore be positively impacted by PIPE’s efforts in the long term.

**Discussion**

**Lessons in designing for impact at scale**

The past 3 years of PIPE have provided valuable insights on how to design both an overall program and market-based education solutions in order to achieve impact at scale. Although the program is still piloting solutions, we describe lessons that could be of value to the field.

Behavior can be very hard to change, but leveraging existing motivations in order to do this can be extremely effective. As described earlier, PIPE is designed to leverage certain existing motivations of key actors in the system. This allows the program to avoid the extremely difficult task of trying to change motivations, and also helps ensure that the program is sustainable over the long term—because actors are doing what they already perceive to be in their self-interest, there is no need for an ongoing intervention. For example, the program uses ABL solutions that develop a range of skills including English, mathematics, working in teams, and executive function. But what we emphasize are the English and mathematics skills because that is what parents want from preschool.

Other important skills such as team work and collaboration are simply not valued in equal measure. Existing motivations of key actors are also important to consider when selecting particular educational solutions as well. For example, successful implementation of a solution requires the buy-in and support of not just teachers but also parents and school owners. We believe that some traditional programs such as teacher training may struggle if they do not account for the fact that many APS owners do not perceive teacher training to be in their interest, and are concerned that trained teachers are likely to be poached by competing schools.

The principle of leveraging existing motivations will often require pragmatism in terms of what the program sets out to achieve. While educating parents about the benefits of team work might be ideal, in reality it is more effective to focus on the skills they already value that can be delivered by ABL, especially in a market-based approach where parents are expected to pay for the solution. Additionally, a reality of translating solutions designed for contexts other than the APS market is that they often have to be adapted in ways that may diminish their developmental impact. For example, a solution that would ideally be delivered in a vast open area and allow for plenty of gross motor development may have to be confined to a smaller area and to activities that do not provide the same degree of gross motor development. An additional aspect of pragmatism involves selecting solutions that provide the school with an end-to-end solution rather than a single element that we might deem to be the most important. Just training the teacher on ABL will be ineffective if she does not have the teaching guides and other materials that can scaffold her during classes. In our experience, successful solutions provide all the elements required for successful implementation. These include teacher training, curriculum, teaching–learning materials, and ongoing monitoring, support, owner engagement, and troubleshooting.

PIPE reveals the importance of understanding the system, the key actors, and their motivations. This takes considerable time and upfront investment. In general, we would suggest the following
broad approach in terms of structuring a program to achieve sustained impact at scale:

**Foundation.** Lay the foundation for the program by building a knowledge base which informs the program’s ToC and approach. This should include extensive secondary and primary research. For example, PIPE interviewed over 4400 parents, 28 APS owners, 40 teachers, and over 200 stakeholders in order to learn about the system.

**Action research.** Interviews and desk research have limitations. For example, key questions, such as the kinds of practical challenges that emerge when translating a solution from a high-end school to an APS, cannot be answered. These questions can be answered through action research. To this end, the PIPE team involved itself in many practical aspects of the solution, including sales, teacher training, and parent engagement (detailed in the section Creating Supply). The action research was key in allowing the team to determine what challenges to expect and the approach and activities that would allow it to execute effectively on the ToC.

**Pilot with the right partners.** The next step should be piloting solutions on the grounds with the partners who you believe have the potential to achieve scale. Pilots are when you can work closely with partners to adapt the solution and internal processes in order to be effective in a particular context (APSs in PIPE’s case) and achieve scale. PIPE’s work with its selected partners is detailed in the section on Creating Supply, and involved elements such as supporting partners build-out dedicated teams to serve the APS market and refining their core product to match the capabilities of APS teachers. It is important to note that, for PIPE, a key element in deciding who to partner with was the quality of the management team. The existing solution and business model could be refined through the pilots as long as the management team has the capability and desire to scale. PIPE scanned over 160 potential partners, shortlisted 8 that we thought had high potential, and are finally likely going to be working longer term with 4 partners that have demonstrated both capability and commitment.

**Transition to scale.** Once the selected partners have been configured for the APS market, that is, their solutions and internal processes have been piloted and adapted, the program then has an opportunity to address broader barriers to scale. This should include an ecosystem lens of addressing barriers for the entire sector rather than just selected partners. For example, addressing policy barriers that may limit scale. With specific partners, the focus of the work can now shift to aspects such as helping with the expansion strategy to new geographies, ensuring access to capital in order to scale, or optimizing the solution for effectiveness at scale.

**Be prepared to pivot.** In order to be successful, programs must be able to respond to changing conditions and new information that is learned by working in the system. This can often require very significant pivots in terms of approach and activities. For example, work to scope and design PIPE (prior to the start of the foundation phase) led the team to develop an approach focused on scaling chains of preschools. These were institutions that would specialize in and would not offer any classes beyond kindergarten. However, data from the parent interviews in the foundation phase revealed that 74% of 4- and 5-year olds were attending preschool at attached providers offering classes beyond preparatory rather than a standalone preschool provider. The program therefore had to pivot to meet the realities of the market. PIPE was fortunate to have a set of funders who were willing to make the pivot with the team and pursue a new ToC that was informed by the new data that had emerged.

**Invest in building relationships with partners.** Building an effective working relationship with partners requires patience and considerable effort. Even once an opportunity to create change has been illustrated to a partner; there can be a considerable gap between the partner mentally acknowledging the opportunity and actually deploying resources to leverage it. Bridging this gap is likely to require building trust through consistent support and dialogue over a period of time.

**Invest in credibility.** A key element in achieving impact at scale is the ability to engage with and influence the work of others in the field—credibility is therefore critical. It is important to think about activities that can not only achieve immediate objectives, but also contribute significantly to the broader field and therefore help build credibility. For example, PIPE’s research with an extremely large number of parents (over 4400 across India) allowed it...
to share new and valuable data with the field and bring credibility in terms of understanding a demographic that many other programs and actors were also looking to serve.

**Program risks**

Our experience suggests that achieving impact at scale takes an amount of time that is longer than typical grant periods. PIPE is designed as a 6-year program, at the end of which we expect to set the APS market on the path to transformation but not for that transformation to be complete. The long timeframe can pose several risks:

- **Funding cycles and processes** may not allow funders to commit for the full duration required.
- **Measuring impact** can be extremely difficult as these take a long time to manifest at scale. Much of the early work is action research and pilots, which are not intended to demonstrate impact at scale.
- **Securing commitments** from the various partners (not just funders) over such a long time period can be challenging as priorities and focuses for the partners continue to evolve.
- **Pivoting with partners**. As described above, it is often necessary to pivot in order to be responsive to the realities and changes in the system. This can be challenging to do when funders and other partners have already bought into and committed to a particular approach or set of activities that were proposed to them prior to the pivot.
- **Grant funding for market-based solutions**. Programs that support market-based solutions often direct significant resources and funding toward supporting private enterprises and entrepreneurs. It can be very challenging to raise grant funding that goes toward a for-profit enterprise, regardless of the social impact it produces.
- **Viability of a market-based solution**. It is often impossible to determine whether a viable market-based solution exists (i.e., a commercially viable enterprise that produces considerable social good) without considerable action research and piloting of a number of models. There is a considerable risk that the Program may not be able to find a viable market-based model even after several years of work.

While PIPE is an audacious and potentially system-changing program, it requires a strong focus on parent engagement, owner and teacher mind-shift change, and implementation in order to truly create impact and be sustainable. Impact on student outcomes will take some time to show and PIPE needs to, in the interim, consider thinking more about possibilities for earlier, if partial, results. This can be achieved through interviews and classroom observations using existing tools in order to document impact and sustainability. While there is a lot of existing literature on the importance of preschool years and the impact of ECE interventions on children from disadvantaged backgrounds, this program addresses key demand and supply-side challenges specific to the affordable private school market. Understanding and addressing demand-side challenges is a critical aspect of implementation research in the ECD field that has received little attention. Good-quality early childhood programs and interventions lead to stronger foundation and ensure that all children have a fair chance to reach their potential. This paper thus makes a significant contribution in adding to the understanding of supply and demand-side challenges. In order to bring sustainable high-quality ECE to affordable private schools, it is important to not only focus on and support supply but equally critical to create and catalyze demand.

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Competing interests
The authors declare no competing interests.

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