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Starting from Scratch | Role of Parents, Teachers and Tech in Early Childhood Education during COVID-19

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List of Abbreviations

ECE	Early Childhood Education
FLN	Foundational Literacy and Numeracy
ICDS	Integrated Child Development Services
MCGM	Municipal Corporation of Greater Mumbai
NEP	National Education Policy
NGO	Non-Governmental Organisation
PPP	Public Private Partnerships
RTE	Right to Education
RTI	Right to Information
SL	School Leaders
SW	Social Workers
TLM	Teaching Learning Material

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Significance of ECE

The imperative of Early Childhood Education (ECE) has become increasingly recognized for its benefits to children across their lifetimes. Over 85% of brain development is said to happen in the first six years of a child's life (MHRD, 2020) with opportunities for physical growth and cognitive development being most optimal up to the age of eight years (UNICEF, 2012).

A rich body of recent evidence shows that children who access high-quality ECE, along with nutrition and health in early childhood, show gains in cognitive and socio-emotional development and foundational learning (UNICEF, 2012), which increases their future learning (Kaul, 2016) and earning capabilities (Gertler, et al., 2014)

More importantly, children lagging behind in learning during ECE, are found to lag behind in later years too (UNICEF, 2020; Silberstein, 2021). Thus, where delivery of ECE along with allied services of nutrition and health is inequitable, it stands to preserve cycles of poverty, with low learning capabilities of students following them through schooling and into the job market (Arnold, 2004).

Investments in universal and high-quality early childhood education can have the highest rate of returns compared to any other stage of education (Heckman, 2012; World Bank, 2018) with benefits for individual children and society (UNICEF, 2020)

Significance of Parental engagement for ECE

Parental engagement in children's education is seen to greatly improve the learning capabilities of children (Heckman, 2012) as well as shows gains for children's social adjustments and behaviour (Nokali, et al., 2010), self-esteem (Goodall & Vorhaus, 2011), and mental health (Jeynes, 2003; Smith, et al., 2020).

Especially in the early years, parents and caregivers can hugely influence children's overall development through their everyday behaviours (Lugo-Gil & Tamis-LeMonda, 2008; Hart and Risley, 1995) as well as by supporting their learning (Vygotsky, et al., 1978). For example, simply speaking with children during daily activities can improve language skills in the early years (Arnold, et al., 2000). Similarly, (Sénéchal & LeFevre, 2002) found that "direct parent-child learning interactions" at home, such as reading books together, and storytelling can lead to improvements in foundational literacy and numeracy skills in school.

During COVID-19, the site of education shifted from schools to homes, making the role of parents in engaging their children in education far more crucial than ever before (UNICEF, 2020). Students in the age group of 3-6 years old are unable to learn independently through any mode, requiring support and supervision from caregivers (Schroeder & Kelley, 2009), and especially with digital modes of interaction (Borup, et al., 2014; Woofter, 2019)

Barriers to parental engagement

Various barriers prevent caregivers from engaging in the education of their children, even prior to the COVID-19 pandemic. Parental engagement is likely to be determined by the perceptions of parents about the importance of engaging with their children's education, which itself will be dependent on the knowledge they have about how their engagement might influence the learning and development of their children. The cognitive capability of parents to support their children's education might also determine the quality of parental engagement (Mani, et al., 2013). Another associated barrier could be knowledge about methods to effectively engage and facilitate children's learning (Taylor & Wright, 2019; Dighe & Seiden, 2020), and in the context of remote learning, low self-efficacy about using technology (Povey, et al., 2016).

Finally, the socio-economic backgrounds of households play a critical role in determining parental engagement in the household. (Brossardi, 2020) find that children with less educated and economically worse-off parents are less likely to

receive learning support at home, compared to their better-off counterparts. Low-income households are also less likely to have educational resources required to support ECE in the household (Hornby & Lafaele, 2011), including access to educational resources required for remote learning such as devices and internet access (Hohlfeld, et al., 2010; Hollingworth, et al., 2011). Further, low-income households might also struggle to create time to teach their children, especially if all adult caregivers are engaged in paid work (Hornby & Lafaele, 2011; LaRocque, et al., 2011).

Thus, engaging parents in ECE delivery for their children requires alleviation of a variety of barriers, particularly for already disadvantaged and under-resourced households (Liu, et al., 2010; Murphy & Rodríguez-Manzanares, 2009; Boulton, 2008). Such challenges have only been exacerbated during COVID-19. Parents have struggled to understand how to engage their children, and especially using digital modes of interaction with teachers. Literature from other, primarily international contexts as highlighted by (McCoy, et al., 2021) finds that parents of young children have reported increased stress levels and suffering mental health, since the start of the pandemic. This will likely further compromise their ability to prioritize, invest in and meaningfully support their children's education (Brown, et al., 2020; Liu, et al., 2010).

The status of ECE during COVID

Despite its importance, little attention has been paid to the continuance of ECE or to supporting caregivers, during the pandemic.

In 2020, low to upper-middle-income countries around the world had lost between 90 and 122 days of pre-primary education (UNESCO, et al., 2021). Only 60% of countries that started remote learning support during the pandemic did so for ECE (UNICEF, 2020) while many countries did not include ECE educators in training and support programs offered to other teachers (UNESCO, UNICEF, World Bank, 2020). Similarly, limited support has been provided for parents and caregivers during the pandemic (McCoy, et al., 2021; UNICEF, 2020). Such disruptions are likely to appear as developmental delays among children who have lost the opportunity to participate in ECE during COVID-19.

Even where digital modes were adopted for ECE, there is little evidence about whether these will be effective or appropriate for learning (Kim, 2020).

Limited evidence on ECE delivery in India during COVID-19

There is growing evidence on education during COVID-19 for children in primary school-going age in the Indian context. Studies found that up to 80% were learning little to nothing during the pandemic (Shah, 2020) with several citing inaccessibility of digital resources as a primary reason for non-engagement (Shah, 2020; Azim Premji Foundation, 2021). This was worse for marginalized groups, such as children with disabilities (Pandey, et al., 2020), girl-children (Kundu & Sonawane, 2020), and students in rural areas (Roadscholarz, 2021). Such issues of access and low engagement have continued as schools for younger age groups remain closed (Roadscholarz, 2021). As a result of disruptions to education delivery, 92% of children had lost at least one language ability, and 82% had lost at least one mathematical ability (Azim Premji Foundation, 2021), while several students - up to 62% in some regions - were dropping-out from school (Shah, 2020).

This is however limited on the status of ECE delivery during the COVID-19 pandemic. A study interviewing Anganwadi workers in the first five months of the pandemic stated that 50% had reported delivery of ECE was taking place at a lower scale and frequency compared to prior to the pandemic (Accountability Initiative, 2021). Another report in the early days of the pandemic highlighted initiatives of individual states such as Tamil Nadu, Odisha, and Gujarat in shifting ECE to digital modes of instruction (Poddar & Mukherjee, 2020).

We fill the gap in evidence on the status of ECE delivery, eighteen months into the COVID-19 pandemic in India, by studying the delivery of ECE in two categories of pre-schools or ECE centres

attended by low-income households in urban Maharashtra - balwadis and pre-school grades (Junior K.G.) of Akanksha schools. During COVID-19, both types of schools piloted a structured technology or digital programme (henceforth, structured tech program) called E-paathshala in partnership with Rocket Learning, a non-profit Educational Technology ("Ed-Tech") organisation working on foundational learning for children between ages of 3-8 years.

We collected data between April and June 2021, at the height of the second wave of COVID-19 in Maharashtra, from 676 low-income urban households enrolled in Akanksha schools and balwadis across Mumbai and Pune, and in-depth interviews were conducted with 58 teachers employed in balwadis and Akanksha schools.

All three models of ECE delivery studied in this report are dedicated ECE centres, which is distinct from the "status quo" for ECE delivery – the Anganwadi system – run under the Integrated Child Development Services program of the Ministry of Women and Child Development, Government of India. Anganwadis are the largest provider of ECE in India. However, their responsibility of delivering Early Childhood Care and Education includes aspects of health, nutrition, immunization, for age groups from 0-6 years, along with ECE for the age group of 3-6 years. As such, the delivery of ECE has reportedly underperformed, and in many cases been deprioritized (Ganimian, et al., 2021).

Through this report we aim to answer the following questions:

1. What has been the experience of low-income urban households and their teachers with ECE during COVID-19?
2. Who has been able to access ECE during COVID-19?
3. Can a "structured digital program" and a "structured teacher support program" work to enable parental engagement for ECE, and what principles can be learned and adopted from these programs?
4. How do key stakeholders feel about the continued use of technology for ECE?

Part B) Study Design

Models for ECE provisioning in Urban Maharashtra

We study the delivery of ECE during COVID-19 school closures in two categories of ECE centres or pre-schools - balwadis and pre-school grades of schools run by the Akanksha Foundation.[1] Both these pre-schools aim to cater to low-income households in Mumbai and Pune, Maharashtra.

In response to COVID-19 related school closures, both types of schools piloted a structured tech program called the *E-Paathshala program* in partnership with Rocket Learning[2] between January and June 2021. The E-Paathshala program is a structured low-tech program that creates, curates, and disseminates digital ECE content to enable parents and children in low-income and under-resources settings to engage in ECE at home. It has been expanded to cover all 819 balwadis run under the Municipal Corporation of Greater Mumbai (MCGM) post the pilot period, for a duration of three years.

E-Paathshala Program

The E-Paathshala program is a digital intervention by Rocket Learning that provides structured and age-appropriate content for 3-8 year olds (enrolled in ECE, and Grades 1 and 2), following a well-defined curriculum for ECE.[3] For the purpose of the partnership with the MCGM balwadis, content shared as part of the E-Paathshala program was in Hindi or Marathi medium, based on balwadi's medium of instruction. For all Akanksha schools the content shared was in Hindi medium.

In this model, parents along with the class teachers, are added to a WhatsApp group on which the E-Paathshala educational content is circulated. The teacher's role in the model is to motivate parents and children to participate in the program by conducting educational activities at home and sending photos or videos of the child engaging in activities on the WhatsApp group.

Rocket Learning adopts a behavioural change framework which contains three main elements of building parental - Awareness, Information and Motivation.

1. Awareness – This includes creating knowledge and aspiration among parents about the need for home-based learning and building their ability and responsibility to engage in this. This is done through different communications campaigns and information dissemination with the objective of encouraging parents to engage in ECE with their children.
2. Information -
    - Learning content is designed to engage adults together with children and to support parent-child interactions at home, since access to smartphones or devices is usually with parents or adults within the household at this age. Learning content demonstrates play-based activities that parents can easily do with children at home.
    - Audio-visual content is designed to support parents who are illiterate or first-generation learners.
    - Content is circulated in the form of bite-sized videos of 2-3 minutes each of <5mb to minimize data usage, and in keeping with memory and attention span constraints.
    - Activities showcased in videos use materials that should be easily available in most low-income households, or can at least be easily procured.
    - Content is delivered every day, using the low-tech mobile application WhatsApp. The choice of WhatsApp is guided by the fact that the application is relatively familiar to low-income households.

3.Motivation- The program uses a "social incentive and rewards model" with the purpose of encouraging greater participation of parents and children in activities. Teachers are expected to share "smileys" (smiley face emoji) and other signs of appreciation on the WhatsApp group, in response to parents who share videos or images

[1] The Akanksha Foundation has a, "mission to build the largest network of innovative schools that empowers children to maximize their potential and that influences systemic reform." https://www.akanksha.org/

[2] Rocket Learning is a non-profit Ed-tech organisation working on foundational learning for children between the ages of 3-8 years. https://www.rocketlearning.org/

[3] The program was first developed in March 2020 and is currently being used in 10,000 pre-schools (Anganwadi, balwadis, and pre-schools), catering to over 100,000 students across three states in India.

Balwadis

Balwadis are ECE centres run by multiple Non Governmental Organisations(NGOs) through a Public Private Partnership(PPP) model with the Municipal Corporation of Greater Mumbai(MCGM), with the purpose of catering to low-income communities and areas of Mumbai city where ECE delivery is lacking. As of July 2021, 25 different NGOs were running balwadis under the PPP model.[4]

The balwadis are run under an Operational Services PPP model,[5] where NGOs, tasked with delivering ECE are free to adopt their own approach and principles in running the balwadis. NGOs are provided flexibility of running the operations of the balwadi, including recruitment and management of staff, maintenance of infrastructure, enrolment of students and most importantly, the delivery of ECE. The MCGM provides infrastructure including rent-free classrooms and facilities such as drinking water and electricity in existing MCGM schools to the NGOs. The MCGM further covers the cost of salaries or honorariums of balwadi staff – one teacher and one helper per balwadi.

A total of 819 balwadis - 279 in Marathi, 177 in Urdu, 171 in Hindi, 160 in English, and 32 in other languages including Tamil, and Kannada - are run in Mumbai under this model, as of July 2021. On an annual basis, balwadi teachers conduct surveys in communities surrounding MCGM schools to raise awareness about the balwadi and to enrol students.

During COVID-19, some balwadis continued the delivery of ECE by conducting online classes and sharing digital content with parents. In some cases, the NGOs running the balwadi supported balwadi teachers by sharing digital content, training them for the use of digital platforms and providing learning materials for students. Post the partnership of MCGM with Rocket Learning, balwadi teachers additionally received digital content under the E-Paathshala program. The balwadi staff received varied support during the pandemic, as several different NGOs run the balwadis and each one of them is given autonomy in the delivery of ECE.

The Akanksha Foundation Schools

The Akanksha Foundation (henceforth, Akanksha) is a 30-year-old NGO that runs "innovative schools" for children from low-income communities of Mumbai and Pune, urban Maharashtra. Akanksha runs 21 English-medium schools with grades from Junior K.G. to 10th grade, under a PPP model with the municipal corporations of urban Mumbai and Pune. Under this partnership, Akanksha is provided rent-free spaces from the State, and has the flexibility to determine the approach and philosophy for running schools, similar to the case of balwadis.

Of the 21 schools run by Akanksha, 17 have Junior K.G classes or pre-school grades, with an enrolment of 815 students. Parents looking to enrol in these schools are required to submit an application form, after which they are selected based on a lottery system as mandated under the Right to Education (RTE) Act.

[4] The Education Department of the MCGM runs balwadis under a PPP model - wherein the MCGM releases a tender inviting NGOs wishing to run balwadis to apply based on predetermined criteria, including NGOs'- experience in education; experience of measuring learning outcomes and examples of impact; proposed approach to pedagogy, teacher training, etc.

[5] As understood by the authors of this report, through information gathered from filing RTIs and conducting interviews with some of these NGOs, as a part of an upcoming study explaining the PPP model of ECE delivery in urban Maharashtra.

Structured vs. Unstructured Approached to Parental Engagement

In this study, we focus on understanding the approach taken by both ECE centres to facilitate parental engagement in the process of teaching and learning. In balwadis and Akanksha schools, teachers described providing educational support and non-education support to households during the pandemic. We find that compared to balwadis, the Akanksha schools appear to follow a more structured approach to parental engagement and interaction during the pandemic. A primary reason for this could be that such practices were well-established prior to the pandemic.

In balwadis:

Educational support: When asked to describe their work responsibilities in continuing ECE during the pandemic, balwadi teachers' descriptions varied. Most described sharing digital content over WhatsApp, and some were conducting live classes. Different teachers cited the following responsibilities as part of providing educational support to parents - curating or designing content, sharing content with parents, following-up with parents to complete activities, and responding to parents on WhatsApp groups when they completed work. In addition, some contacted households not just on digital platforms but also through phone calls, home visits, and by calling parents to schools to pick-up worksheets and assignments.

Parent-teacher interactions were described as being important to continue ECE during the pandemic, but appeared to be incidental to the process of continuing delivery of ECE during this time, rather than a pre-planned exercise. Most balwadi teachers did not mention that they had followed practices for engaging parents prior to the pandemic. In fact, some described that when they were asked to add parents to WhatsApp groups as part of enrolling them into the E-paathshala program, they had to find and update contact numbers for parents of their students.

Non-educational support: In some cases, balwadi staff were involved in community work during the pandemic, such as helping households to procure rations and medicines. Such undertakings however were ad-hoc and on the initiative of individual teachers or organisations running balwadis. Most balwadi teachers also appeared to lack any structured support from institutions (the MCGM or the organisations) to strengthen parent-teacher interaction, or to track down households that could not be reached physically or over the phone.

In Akanksha schools:

Educational Support: Most teachers in Akanksha schools described a consistent set of responsibilities they were required to undertake to continue education during the pandemic.

1. *Planning content:* Teachers described the planning process as including a) mapping key concepts and activities by curriculum on a timetable; b) sourcing digital content to cover each concept by curating ready-made videos, making videos, or relying on E-Paathshala videos; c) planning modes of delivery and frequency for sharing content with parents; d) conducting meetings with parents to discuss content and clearing their doubts, e) following-up with parents to ensure activities are done, f) reviewing activities and providing feedback to parents.

Teachers described routinely re-grouping with their co-teachers, principals and schools leaders, to discuss components of lessons that worked and where they could be improved. Some teachers also described having a format for recording attendance, and "tracker systems" for tracking children's progress, including conducting weekly assessments.

2. *Parent-teacher interactions:* Akanksha teachers described a core philosophy of treating "parents as partners" in the delivery of ECE, which was adapted to the approach pandemic. They described two main interventions that they followed prior to the

pandemic to engage parents - a) **Parent's Classes** - wherein parents were introduced to concepts and skills that their children would learn over a fortnight and given instruction on teaching their children at home, and b) **Adult Classes** - for parents with low literacy or numeracy skills to be taught basic reading, writing, and arithmetic.

During school closures, parent-teacher interactions were adapted for remote modes. Teachers described conducting a) weekly live lessons for instructing parents on teaching methods, and clearing doubts, b) monthly parent-teacher meetings to discuss the child's progress, and c) fortnightly well-being calls to discuss non-educational needs and issues of households.

3. Additional programs: Teachers also described additional programs they designed to enable a more holistic learning environment for children at home, such as organizing co-curricular activities, and school-wide assemblies or festival celebrations in virtual sessions.

Non-educational support: Teachers described supporting households through dedicated social workers embedded in communities from which students came even prior to the pandemic, in an effort to alleviate barriers that prevent parents from accessing and engaging in education. They acknowledged that such barriers are often rooted in social and economic disadvantages of households, due to which teachers, principals, social workers, office assistants, and other ancillary staff at Akanksha would conduct routine home and community visits to familiarize them with backgrounds of their students. During the pandemic, while home visits could not be conducted, teachers held one-on-one well-being calls with parents, where they documented any urgent needs households had, and relayed them to social workers, who would then try to meet these needs, such as providing rations, and devices and internet recharges for education.

Part B) Study Design

Sampling And Data Collection

Data was collected from 676 households enrolled in Akanksha schools and balwadis in Mumbai and Pune. In-depth interviews were conducted with 58 teachers - 43 balwadis and 15 Akanksha teachers.

Respondent	Households	Teacher
Balwadis	365	43
Akanksha Schools	311	15
Total	***676***	***58***

Further details about the sampling process are presented in Note 1 in Appendix A. All surveys were adapted to and administered telephonically. Surveys with households were conducted in Hindi and Marathi, and interviews with teachers were conducted in Hindi, Marathi or English, based on the preference of respondents.

Surveys captured social and economic characteristics of households before and during COVID-19, details about education of all children residing in households, and parent and child engagement in ECE. Additionally, open-ended questions were asked about reasons for high and low parental engagement in ECE, experiences with digital education and with the structured tech program.

In interviews with teachers we asked questions regarding their experience of teaching and learning through digital modes and with the structured tech program, and practices they adopted for engaging parents as educators during COVID-19.

The period of data collection - from 17th April to 18th June 2021 - coincided with the peak of the second wave of COVID-19 in Maharashtra, and almost completely overlapped with the lockdown in Maharashtra, which spanned from 3rd April to 3rd June 2021. It is possible that collecting data during this period led to a high attrition rate among respondents, while surveyors hired for data collection were also impacted by the pandemic.[6]

Additionally, both balwadis and Akanksha schools had annual summer holidays between 1st and 31st May 2021. In Akanksha schools, this meant that no live classes were conducted, and the frequency of digital content sent through the structured tech program was reduced.[7] In balwadis, there was no change in frequency of the structured tech program. Since both time-periods of the lockdown and summer holidays could have a bearing on the level of parental engagement, these have been factored into the analysis.

[6] Surveys were adapted for telephonic administration, which included reducing the length of surveys, and removing several open-ended questions. Training for surveyors included special focus on protocols for conducting surveys telephonically, such as repeating response options multiple times to ensure respondents were familiar with them before recording a response. Surveyors were also instructed to set appointments with respondents for the survey duration. Despite this, surveyors were required to pause and re-start surveys as per respondent availability on multiple occasions.

[7] During the scheduled summer holidays in the month of May, the frequency of content shared through the tech program was reduced - from 3 activities daily for five days a week, to 2 activities daily for five days a week. This change to the program was only made in Akanksha schools, and not in studied balwadis.

Sample Description

Schools in the sample

Balwadis and pre-primary classes of Akanksha schools, while catering to low-income households, do not represent the "status quo" in terms of providers of ECE in India.

Anganwadi centres are the largest provider of ECE in India, catering to an estimated 3.7 crore children across the country. The large ambit of responsibilities that fall to Anganwadi centres,[8] however, means that the delivery of ECE is found to be underperforming. (Ganimian, et al., 2021) found that of two hours scheduled for ECE delivery or "pre-school instruction" with children, Anganwadi workers in Tamil Nadu spent only 38 minutes per day on instruction. Similarly, studies in Anganwadi centres across states found that children spend "a large amount of time sitting around with no planned activity" (Kaul & Sankar, 2009; Kaul, et al., 2017), , with others advocating for increasing staff in Anganwadis to improve effectiveness of ECE delivered and learning outcomes of children (Ganimian, et al., 2021).

In the context of COVID-19, Anganwadi workers acted as frontline workers for spreading awareness of COVID-19 and in vaccination duties, while also continuing the variety of responsibilities they usually do. On the other hand, balwadi centres studied in this report are dedicated ECE centres, where one balwadi teacher and one balwadi helper are employed with the sole purpose of delivering ECE to students. Similarly, teachers of Junior K.G grades in Akanksha schools have the primary responsibility of delivering ECE. Importantly, both balwadi and Akanksha school teachers are employed by NGOs that work with the state through public-private partnerships for running the schools. They are not state employees.

Experiences and opinions of teachers in this sample are thus likely to vary considerably from that of other ECE educators in the country, and especially of Anganwadi workers. For these reasons, results on the status of ECE delivery, accessibility of ECE and parental engagement presented in this report might reflect a more positive scenario than what delivery of ECE has looked like for the rest of the country during the pandemic.

Teachers in the sample

Data was collected from 58 teachers - 43 employed in balwadis, and 15 employed as pre-school teachers in Akanksha schools. On average teachers in our sample were 40 years of age, and had a little over 11 years of experience as ECE educators, with a few having over 20 years of experience. Educational qualifications ranged from 10th grade to postgraduate qualifications (such as Master's in Education). In Akanksha schools, the lowest educational qualification of a teacher was a Bachelor's degree.[9]

Households in the sample[10]

The sampled households are low-income households residing in urban Maharashtra. Due to the pre-schools from which these households were sampled they are relatively more disadvantaged when compared to the average household in urban Maharashtra. Median household incomes in our sample were reported as INR 12,000 per month, prior to the COVID-19 pandemic. More than 80% of households reported a fall in monthly household income during the pandemic, with a reported fall of about 34% on average. More than 80% of mothers of the sampled children were engaged in unpaid household work, while mothers engaged in paid work were primarily domestic workers. About 40% of fathers of the sample children worked as daily-wage labourers, and only about 7% were involved in skilled labour (e.g.: as AC Technicians or Electricians). Almost 5% of the households reported the primary breadwinner was unemployed at the time of data collection.

[8] Anganwadi workers are responsible for delivery of Early Childhood Care and Education, where ECE is only one of six broad responsibilities they undertake. Others include health, nutrition supplementation, and immunization of 0-6 years old, health and nutrition of pregnant mothers, and health for adolescent girls.

[9] Norms for employment of teachers - minimum educational qualifications mandated - differed between balwadis and Akanksha schools. For balwadis the minimum educational qualification was 10th pass plus a 2-year Early Childhood Care and Education certification, whereas for Akanksha schools the minimum qualifications were a Bachelor's Degree plus an Early Childhood Care and Education certification.

[10] Refer to Table 1 in Appendix B.

Similarly households in our sample were socio-economically and educationally more disadvantaged compared to the average person in urban Maharashtra. About 48% of mothers and 56% of fathers had ten or more years of schooling respectively, compared to 61% adult female and 68% adult male in urban Maharashtra (NFHS-5, 2019) . Our sample also had a higher population of Muslim households at about 32% and lower share of Scheduled Caste(SC) and Scheduled Tribe(ST) households, at 11% percent SCs and 2% STs, compared to population averages for urban Maharashtra (NFHS-5, 2019).

The mean age of sampled children was 5 years, with equal representation of male and female children. Less than 1% (nine children) reported having any disability.

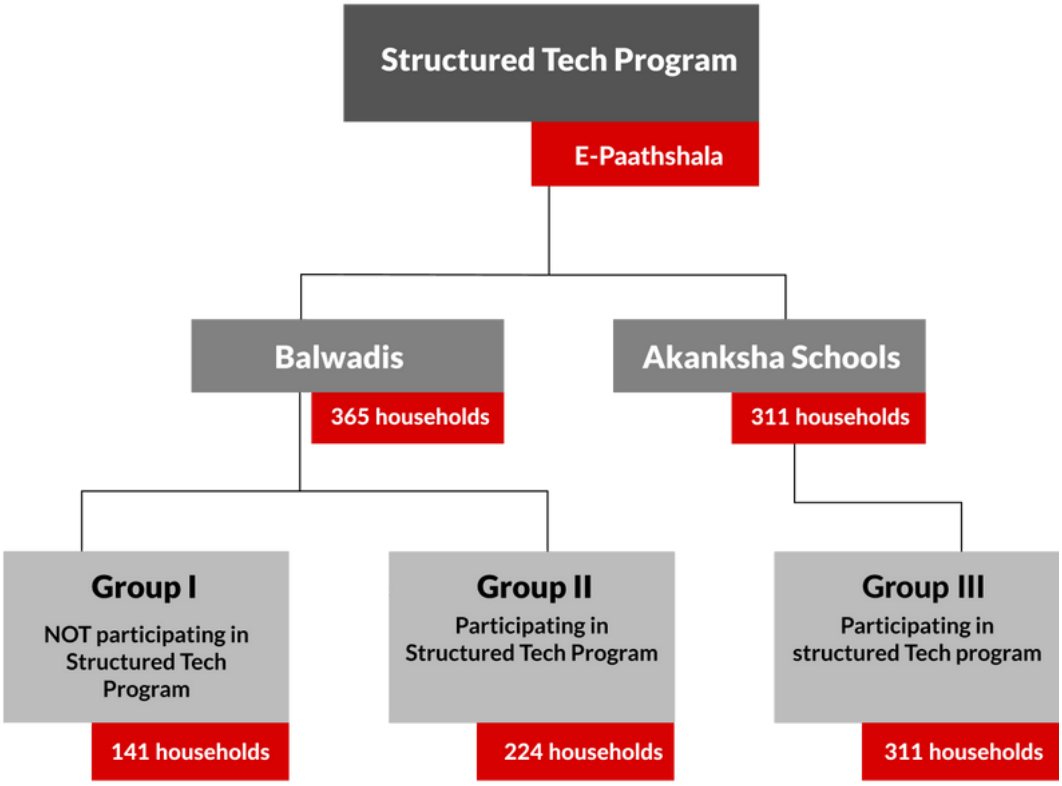
Comparison groups based on access, and interaction with ECE programs

Through the data captured from teachers and households, we derived an understanding of the nature in which schools were able to engage with parents and children for ECE during COVID-19. Based on access and interactions of households with the programs, we divide the sample into three groups.[11]

Group I: Households enrolled in balwadis and not participating in the structured tech program

Group II: Households enrolled in balwadis and participating in the structured tech program

Group III: Households enrolled in Akanksha schools and participating in the structured tech program



[11] These numbers reflect participation in the structured tech program at the time of data collection, and it is possible that households in Group I might start participating in the tech program, and households in Group II might stop participating in it over time

Group I and Group II households are both enrolled in balwadis, however despite being enrolled onto the WhatsApp group for the tech program, 20.9% of the total sample were not participating in the program. The sample of households enrolled in balwadis were thus split into two groups on the basis of their response to the question - whether they receive and engage with the Rocket Learning digital intervention.[12]

Group III consists of households enrolled in Akanksha schools. All of these households were receiving the structured tech program, and their participation in the program was corroborated by Akanksha teachers. The basis of separating these households from households enrolled in balwadis, was the structured nature in which Akanksha households received support from teachers and schools during COVID-19. Akanksha schools were conducting weekly live classes on digital synchronous platforms such as Zoom and Google Meet, which were aligned with the content shared under the E-Paathshala program, and they had adapted their various initiatives for enhancing parental engagement to digital platforms.

This is in contrast to the relatively unstructured nature in which balwadis (teachers and school administration) were able to engage with parents during COVID-19. In balwadis, continuance of ECE and parental engagement relied on the individual NGOs running each balwadi. This resulted in teachers not receiving structured content to engage parents. As interviews with teachers and NGOs revealed, NGOs running balwadis would share content with teachers sporadically, which teachers could choose to share with parents.

In comparing the *modus operandi* of these two categories of schools and specifically the role of teachers in both, we make the differentiation that in the case of Akanksha schools, teachers were providing routine/ regular and planned support to engage parents and children in learning, whereas not all balwadis were able to. For this reason we categorize Group III households (in Akanksha schools) as receiving "structured teacher support", compared to the "unstructured teacher support" households in balwadis received.

	Tech	Teacher	% of Sample
Group I: Households NOT participating in E-paathshala	Unstructured	Unstructured	20.9%
Group II: Households participating in E-paathshala	Structured	Unstructured	33.1%
Group III: Households enrolled in Akanksha schools (and participating in E-paathshala)	Structured	Structured	46.0%
Total			***676***

[12] This question was asked in multiple ways to ensure respondents were clear about what program we were referring to. Various names of the program including Rocket Learning, E-Paathshala, and others were provided to respondents, and additionally the program itself was explained as one where parents were added to a WhatsApp group with other parents and their child's teacher wherein short videos were sent daily to which parents had to respond with a video or image of their child completing an activity.

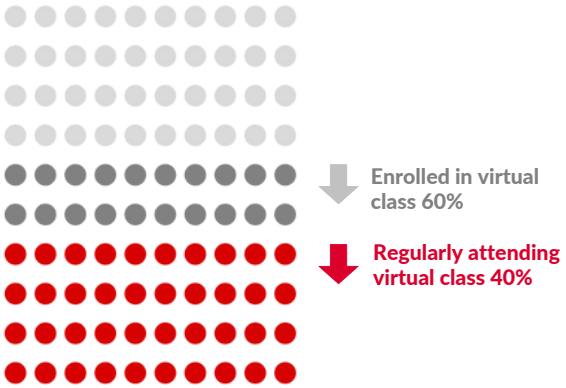
C.1) ECE during COVID-19

The pandemic induced school closures shifted the site of education to homes with parents becoming the educators and teachers taking on new roles and responsibilities in addition to teaching. This section describes the teaching and learning process for ECE and perceptions of parents and teachers about the delivery of ECE during the pandemic. Experiences of stakeholders with the the studied ECE programs (described above) are discussed in later sections of the report.

STATUS OF ECE DELIVERY[13]

Across the sample, less than 2% households reported that no teaching and learning for ECE happened during the pandemic, while the rest reported that ECE continued through digital modes of instruction.

Reduced class size in digital education



Enrollment in virtual classes fell by 30-40%, while the class size for those regularly attending and engaging in ECE in virtual classrooms fell by up to 60%, compared to pre-pandemic class sizes. This was attributed to 1) inaccessibility of devices and the internet, 2) parents being unable to invest time in their child's education due to work and other care responsibilities, and 3) a lack of priority for ECE within households.

Median class sizes prior to the pandemic were about 20 students per teacher in both balwadis and Akanksha schools. Teachers reported that when classes shifted to digital modes, several students could no longer access them due to unavailability of devices or internet connection. As a result, enrolment in classes dropped considerably, leading to a class size that had fallen by 30-40% of its strength prior to the pandemic. This was even higher for balwadis where some teachers reported enrolment numbers falling by more than 60%.

Even if parents were able to access virtual classrooms, many were unable to attend lessons regularly for a variety of reasons. Teachers reported that if they counted class sizes by those regularly attending lessons, they had fallen by over 60%. Once again, this was far higher for balwadis, where teachers reported class sizes had fallen by more than 80% in some cases.

Preference for WhatsApp in digital education

For those with access to virtual classrooms, Whatsapp was the primary mode of instruction, followed by live classes.

86% used WhatsApp

56% used platforms for live classes

86% of households received education on Whatsapp, 56% used platforms like Zoom or Google Meet for live classes. The familiar and low-tech platform of WhatsApp (over live lessons) was preferred by teachers and parents.

[13] Refer to Table 2 Appendix B.

In Balwadis: Teachers reported primarily using WhatsApp for regular teaching, communication and instruction for parents and students. Parents of balwadi students having access to internet-enabled devices were added to a WhatsApp group along with teachers, the principal, and the administrative officer of the balwadi. In some cases, teachers had made these groups before the start of the structured tech program in January 2021, and were making and sending their own content in addition to videos shared through the structured tech program. In other cases, the WhatsApp groups were made as part of implementation of the structured tech program.

In Akanksha schools: Teachers reported using WhatsApp to share educational content with parents, in addition to other digital modes of instruction they employ. For example, they shared pre-recorded lessons over WhatsApp, which were then discussed during live classes. They also reported using WhatsApp when parents were unable to join live lessons, in which case they shared voice notes or recordings of the live classes with parents.

Limited use of live online classes

56.2% households reported attending live online classes. This was far higher for households in Group III (enrolled in Akanksha schools) where 74.11% parents reported that their schools conducted live online classes.

In Balwadis: Teachers used synchronous or live classes on platforms like Zoom and Google Meet, irregularly. This was in part due to difficulty of use. They also suggested that parents did not prefer live classes either, as they take up more phone data than content shared over WhatsApp.

In Akanksha schools: While teachers in Akanksha schools agreed with balwadi teachers on the point that parents preferred WhatsApp lessons over live classes, they insisted on live classes so they could see the students while teaching. In order to overcome difficulties of use and parents' hesitation, teachers reported supporting parents in becoming familiar with Zoom and Google Meet platforms.

Teachers reported using both synchronous and asynchronous platforms extensively. Live classes of 40 minutes each were conducted on Zoom at least two days a week, and up to five days a week in some cases. They reported this was especially important as preschool students enrolled in the academic year 2020 had never met their teachers, and thus it was near impossible to form a bond with them without this. Further, live classes allowed for two-way interaction between teachers, parents and children, which was used to clear doubts and provide instruction to parents on engaging children in educational activities.

Phone Calls, Home Visits and School Visits

For households who could not access digital education, teachers used phone calls, attempted to conduct home visits or called parents to schools. Due to hesitancy regarding home visits during the height of the second wave of COVID-19 in the state however, less than 1% of households across the sample reported teachers conducted home visits.

In Balwadis: Teachers said that in order to continue to engage parents who could not access WhatsApp groups, they used phone calls or conducted home visits. Teachers also asked parents to visit balwadis to collect worksheets and submit assignments for the child. They suggested that many parents insisted that teachers provide their children, "writing work" and were thus willing to visit schools to collect and submit worksheets.

In Akanksha schools: Teachers also reported using phone calls to stay in touch with parents, explain concepts and take updates about children's assignments. They suggested that for students they had never met before, they preferred to instruct parents over the phone rather than the child directly. Teachers did not conduct home visits or call parents to schools.

TEACHER'S EXPERIENCES OF ECE DELIVERY DURING COVID-19

Reliance on parental engagement

All teachers reported almost entirely relying on parents to deliver education during the pandemic and emphasised the role of parental engagement as critical for children's overall development even beyond school closures. They described parents as being the "first school" for their children, who learn a lot through observing them. They further suggested that just attending a school was insufficient for a child to learn properly and that revisions at home with the parents enabled children to retain what they learn in the classroom.

> ***Yes, parent involvement is necessary. It is with the parent that the child spends most of its time. It learns by looking at them. Develops habits, good or bad, by observing their parents. So, it is the responsibility of parents to be actively involved in their child's education.***
>
> ***Parents have to be equal partners because the children are more with their parents. They are in the school for maximum 3-5 hours but for the rest of the day, they are with their parents. Without parent's facilitation, guidance or engagement, how will the child grow?***
>
> -Akanksha Teacher

Akanksha teachers prefaced their opinions about parental engagement with the fact that Akanksha schools have had a core philosophy of "parents as partners", long before the pandemic. This became all the more pertinent during the pandemic when children had little to no opportunity to interact with teachers directly.

Teachers agreed that parental engagement had increased during the pandemic possibly as a result of parents having more time to engage with children during the lockdown period, compared to when they were engaged in paid-work. Some teachers also suggested that "active teachers beget active parents", i.e., increased focus in engaging parents during this time by teachers has led to increased parental engagement.

> ***[Prior to the pandemic]... parents were busy with work and they didn't pay a lot of attention to their child's studies and homework. They didn't bother much. But now parents have to support their children to study... I always tell them that your support is at the centre for the child and only when the both of us work together, is it [education] going to happen... and they understand it now.***
>
> ***I think what is making them active right now is them being relatively more free. They are also seeing us taking very active interest and effort in their child education. They know they have the time, they know that they are going to use phones anyway to watch videos and everything and they know that it is important to continue the education of their children. That is why they are being active.***
>
> -Akanksha Teacher

Limitations of digital modes for ECE

Despite their best efforts of continuing ECE during school closures, on being asked about their impressions of how the COVID-19 pandemic had impacted the delivery of ECE, their students, and their parents, teachers pointed to some key concerns. Teachers reported that even after making pedagogical adaptations to digital modes of teaching and learning, they were not convinced about the effectiveness of using any digital modes of instruction for young children, compared to experiences in physical classes. Teachers cited the following key issues with digital modes of education for ECE. They reported:

- Facing difficulties in keeping children's attention for long periods of time on digital platforms, and highlighted that children were easily distracted on devices.
- Unsupervised access and excessive use of devices and the internet can be dangerous for young children, and the habits which students

cultivate in physical schools - writing, reading, learning and general discipline - have been hampered.

- Missed opportunities to establish bonds with children, through in-person attention, and teacher-student and peer interactions has resulted in children becoming more shy
- Struggling with assessing the progress of the children or ascertaining their learning levels properly on digital platforms
- Course content taught in online classes is substantially shorter than what was taught in physical classes. Further, children missed opportunities for physical activities, and hands-on interactions with materials which are important during early years. As a result, there are chances that children might not be prepared to transition to Grade I or senior KG.
- Many children are not regularly engaging with education on digital modes while many others had completely lost touch with teachers since the start of the pandemic. As a result, there are concerns over learning losses with children forgetting what they had learnt in schools prior to the pandemic.
- Children were "locked in the house" and "learning under pressure", rather than enjoying the process of learning since the environment of children's homes might not always facilitate meaningful learning.

Barriers preventing parental engagement in ECE

Teachers highlighted that parents did not have the knowledge, time, resources, and capacity to teach ECE, and further struggled with use of technology. For example, parents are unlikely to have knowledge of appropriate pedagogies for their children, and thus are unlikely to deliver ECE in a child-friendly and play-based manner.

Non-engagement of parents was primarily described as dependent on the socio-economic backgrounds of the households. Common reasons cited were inaccessibility of devices, internet connectivity, and network connectivity for students living in congested areas of the city. Secondly, they suggested that parents of most children in their classes work as daily-wage workers, or informal workers, for whom ensuring an income and food takes precedence over educational needs of children. Further, since parents spend large amounts of the day outside the home for work, teachers find it difficult to reach out to them, even if they make home visits. Teachers thus reported needing to be flexible with parents about timings for calls or sharing children's assignments. Others reported that even with such allowances, some parents and children are not interested, or unable to prioritize participating in ECE.

> ***"Parents would like to be interested in their child's education. But this lockdown has forced a lot of people to lose their jobs. These are daily wage earners and due to which parents are not able to engage with their child's learning."***
>
> -Balwadi Teacher

Factors affecting teachers

Teachers reported concerns of job and income losses, as well as increased care-work and paid-work responsibilities during the pandemic, all of which would likely influence their ability to continue teaching. Over 20% of balwadi teachers were concerned about losing their jobs, while many indicated that salaries paid to them were insufficient, and often delayed. Teachers also highlighted increased care-work burdens during the pandemic, including managing household responsibilities, educational needs of their own children.

C.2) Inequitable Access To ECE During School Closures

In this section, we answer the question of what has determined access to ECE for our sample during school closures. Reiterating from above, households attending balwadis were all enrolled into the structured tech program (added to the WhatsApp groups), however some chose not to participate. Thus households enrolled in balwadis are divided into two groups, on the basis of participation in the structured tech program, where Group I households do not participate in tech program, and Group II households do. In this section we focus on breaking down who Group I households are.

Further, it is important to note that sampled households, while more disadvantaged than the average urban household in Maharashtra, represent only those who we were able to contact telephonically and and who consented to participating in surveys, during the second wave of the COVID-19 pandemic.[14] That these households are relatively advantaged is evinced in the fact that about 98% of households in our sample had access to at least one internet-enabled smartphone. This is likely driven by higher smartphone and internet penetration in Tier I cities like Mumbai and Pune.

THE DIGITAL DIVIDE BETWEEN HOUSEHOLDS

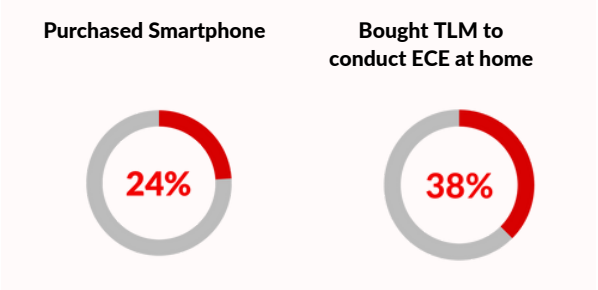
Teachers highlighted incidences of non-availability of devices and internet as leading to a loss of contact and discontinuation of lessons with some students, citing examples of students who had migrated to remote rural areas since the start of the pandemic, where internet connectivity was unavailable. While Akanksha teachers reported trying to stay in touch and provide these parents instruction on educational activities over phone calls, balwadi teachers admitted that in some cases they had completely lost touch with students.

> ***"I am very concerned about children who have completely lost touch with me and I don't know what is happening to their education.***
>
> **-** Balwadi Teacher

The issue of the digital divide is further captured by about 11% of households reporting that they are sometimes unable to participate in digital The issue of the digital divide is further captured by about 11% of households reporting that they are sometimes unable to participate in digital education activities due to internet issues and unavailability of smartphones. A further indication of this divide is that among the nine households that reported at least one of their children had dropped out from education since the start of the pandemic, five had dropped out due unavailability of devices.

INVESTMENT FOR ACCESSING EDUCATION

23.7% of households reported purchasing a smartphone for their children's education, while 37.7% reported purchasing other TLM to engage in educational activities during the pandemic. Of the latter, households were spending a median INR 100 in the one-week period prior to data collection, to acquire materials for conducting ECE activities at home.



[14] Since surveys were conducted telephonically, our sample of households excludes anyone who did not own and did not have access to a smartphone, those who could not be tracked-down by teachers since the start of school closures, those who might have lost access to devices and network connectivity (such as households who migrated to remote rural areas) - due to which they would not have been added to Whatsapp groups for the tech program. It is also possible that those who refused to participate in surveys were in greater distress during the period of data collection, which might also be a function of socio-economic disadvantage and other shocks caused by the pandemic.

C.2) Inequitable Access To ECE During School Closures

Spent on TLM in last week

The ability of households to invest in education determined their ability to access education during school closures, with about 24% purchasing smartphones, and 38% purchasing other educational materials during the pandemic.

Teachers suggested such expenditure by households should not be necessary, and will lead to many not engaging in education.

> ***"I feel that it will be good if the parents receive essential materials as well as materials related to teaching their child (like crayons, sheets, pencils etc.) Giving these teaching materials will get them happy and excited and will be a good incentive for the children to study. When we go to the houses and discuss their problems, unavailability of materials... is the problem that comes up again and again."***
>
> -Balwadi Teacher

THE DIGITAL DIVIDE WITHIN HOUSEHOLDS

Even where households have access to devices, several children within the same household might share a device to access education. In light of this, we sought to understand where ECE features in the priority of households with multiple children. More than 45% households reported that they prioritize older children in the use of phones for education. Teachers corroborated that this is often the case.

> ***"Some parents have more than one child at home and preference is given to the elder child."***
>
> *- Balwadi Teacher*

Children share resources, and households are forced to choose which child will access education

On average, every 3 children share 2 smartphones.

Had fewer smartphones than no. of children

Prioritize older children in use of phone for education

Within households, children share devices for education. 52% of households had less than one device per child, with every three children sharing two smartphones on average. Importantly, 45% of households reported prioritizing older children's use of devices for education, over ECE.

In our sample, while about 98% households owned at least one smartphone with internet, over 52% had less than one phone for each child with a median ratio of approximately two smartphones for every three children. This was lower for Group I households with one smartphone for every two children.

Importantly, several teachers mentioned that inaccessibility of devices within the home was a result of adults needing to take their phones for work, minimizing the time that a device is available to children for engaging in educational activities throughout the day.

SOCIO-ECONOMIC DIFFERENCES ACROSS GROUPS

Differences in social and economic backgrounds of households determine households' access to devices, internet and other TLM, and thus to ECE during COVID-19. Parental education, and especially maternal education, is likely to influence their ability to engage in their children's education too.

C.2) Inequitable Access To ECE During School Closures

We found that social and economic disadvantage follows a gradient in our sample, with Group III households (those in Akanksha schools) being socially and economically most well-off relative to households attending balwadis, followed by Group II households, and then Group I households (those not participating in the structured tech program). Thus, despite our sample being disadvantaged there are still differences between these households.

Average monthly household incomes across the three groups were lowest for Group I households compared to the rest of the sample even prior to the pandemic, and fewer Group I households reported having assets of a TV with cable, a computer, laptop or tablet, and a fridge.

The economic shock of the pandemic was also seemingly worse for Group I households. 87.9% of Group I households reported a fall in income, compared to about 80% in both Groups II and III.

The percentage fall in income was also sharpest for Group I households who reported a mean 50.8% fall in income, compared to 26.8% and 32.7% for Groups II and III, respectively.

On parental education, we found that Group I and Group II households (who attend balwadis) were similar to each other, and relatively worse-off than Group III households (who attend Akanksha schools). Around 14% of households, each in Groups I and II reported that the mother of the sampled child had no formal schooling, compared to only 4.4% households in Group III. Similarly, while approximately 9% of households each in Groups I and II reported that the father of the child had no formal schooling, this was only about 3% for Group III households.

Role Of Tech And Teacher Support Programs In Parental Engagament During COVID-19

It is clear that the role of parental engagement in the success of ECE is crucial. During school closures, parental engagement has been the only means of continuing its delivery. As such, in this section, we present an assessment of whether participation in the structured digital program (E-Paathshala) as well as in the structured teacher support program (in Akanksha schools) was associated with increased levels of parent and child engagement in ECE. The comparison across the three groups helps us identify whether any such association exists. We compare levels of parental engagement of households in Groups II and III to households in Group I who were attending balwadis and not participating in the structured digital program. The Group I households could be said to have been engaging in the default or "business as usual" setting i.e., where they had access to unstructured/ sporadic digital content and unstructured teacher support.

While the overall sample largely represents the targeted population of the programs – low-income households - the previous section highlighted how Group I households were educationally and economically relatively more disadvantaged than Group II and Group III households. Since these differences are likely to confound comparisons on levels of parental engagement across the three groups (e.g.- it could be possible that higher parental engagement may be driven by higher parental education rather than the ECE programs), we account for these factors in a multivariate linear regression model.

The outcome variable is parent and child engagement levels, measured through questions about whether parents and children spend time on ECE educational activities and if so, how muchtime they spend in hours/ days in a week; and whether the amount of time spent has increased "in the last six months". The variable of interest (or the explanatory variable) is one that captures whether households belonged to Groups I (enrolled in balwadis), Group II (enrolled in balwadi and participating in the structured tech program), or Group III (enrolled in Akanksha schools that have a structured teacher support program, and participating in the structured tech program). Several important socioeconomic and demographic characteristics and child-level factors are accounted for in the model.[15] We additionally run a similar model for variables that capture households' willingness to continue participating in the program in the future.

While we find differences in engagement across groups, it is difficult to attribute parental engagement to the programmes/interventions in the current empirical design due to the non-random selection of households into the programmes and our survey. We thus utilise information from open-ended questions asked to parents about the programs and in-depth interviews with teachers about their engagement with the programs to help us corroborate findings from the conditional analyses.

STRUCTURED INTERVENTION LEADING TO HIGHER ENGAGEMENT

The engagement levels are higher for households participating in the structured tech program, and even higher where they have structured teacher support [16]

We find that households participating in the structured tech and structured teacher support programs (Group II and Group III, respectively) are

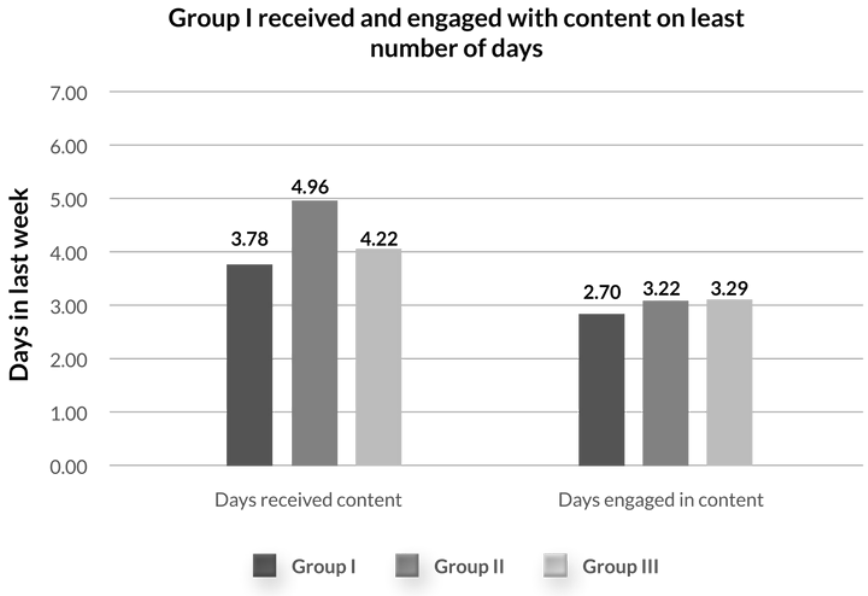
[15] Control variables include gender and age of the sampled child, household size, maternal education, monthly household income, religion and caste group of the households, and ownership of a computer, smartphone with internet, and TV. Additionally, we control for time periods during which the survey was conducted - whether during the COVID-19 lockdown in Maharashtra or once it was lifted, and whether during the one-month summer holiday for Akanksha schools where frequency of digital ECE content was reduced and live classes were not being held by teachers. Finally, standard errors are clustered at the school or balwadi level. All of these factors might have a bearing on the variable of interest and outcomes.

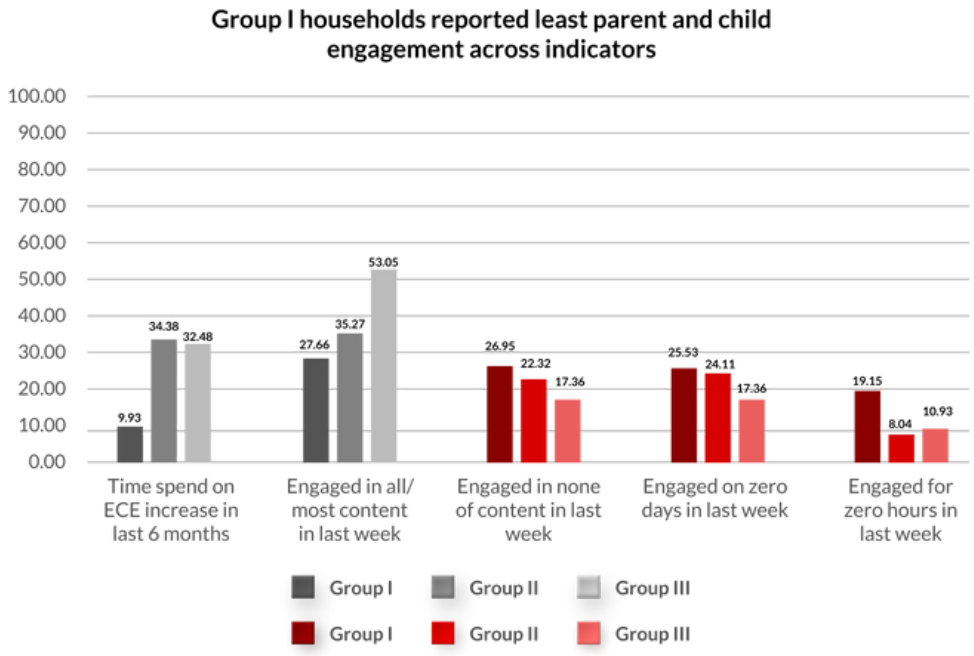
[16] For the purpose of maintaining brevity in the text, results that rely on conditional regression models are reported as raw differences between groups (and not coefficients), and we highlight only those indicators where differences are statistically significant at the 5% level (i.e. $p<0.05$). Regression tables are provided in the annexure, and complete tables can be provided on request.

more likely to report higher parent and child engagement levels. These households receive more ECE content, spend more time engaging in ECE content with their children, and reported that the time spent on ECE content had increased in the six-month period prior to the time of data collection (which would coincide with the starting of the structured tech program in January 2021). These differences persist even after accounting for socioeconomic and demographic indicators.

Households that received both structured tech and structured teacher support (Groups III households in Akanksha schools) are likely to be engaging the most, followed by those in balwadis engaging in structured tech content with unstructured/sporadic teacher support (Group II households), and then finally those that were receiving unstructured content and unstructured teacher support (Group I households). The complete table of differences has been indicated in Tables 1, 2, and 3 in Appendix C.

Across various indicators of parental and child engagement, it appears that participation in the tech program was able to enhance parent and child engagement in ECE for those who participated in it.





C.3) Role Of Tech And Teacher Support Programs In Parental Engagament During COVID-19

Households in Group I (who were not participating in the structured tech program) received ECE content on fewer days (in the one week prior to data collection) on average, compared to the rest of the sample - 3.8 days for Group I, compared to almost five days for Group II households. Group I households also engaged with ECE on fewer days (in the one week prior to data collection). On average Group I households engaged in the content on 2.7 days, compared to 3.3 days in Group III households.

Group I households were significantly more likely to have spent zero days engaging in ECE activities (in the one-week prior to data collection), at 25.5% compared to 17.4% for Group III households. They were also more likely to have reported that they engaged in "none" of the activities received (in the one week prior to data collection), at 26.9% for Group I compared to 17.4% for Group III; and less likely to have reported doing "most or all" of the activities, at 27.7%, compared to 53.0% for Group III. Average hours spent on ECE engagement (in the week prior to data collection) however, did not significantly vary across groups.

Finally, Group I households were also significantly less likely to report that the time their child spent on ECE activities had increased (in the six-month period prior to data collection). While over 30% of Group II and Group III households reported an increase in time spent on ECE activities, only about 10% of Group I households reported the same.

Thus, across various indicators of parental and child engagement it appears that participation in the studied tech program was associated with higher parent and child engagement in ECE, and those that had structured teacher support, in addition, had even higher engagement levels.

HOUSEHOLDS' WILLINGNESS TO CONTINUE THE PROGRAM[17]

Households were also asked questions about their likelihood of continuing to engage in ECE activities with their child at home once schools reopen and if the content from the digital program stopped being shared with them.[18] These questions capture some form of acceptance of parents towards the program and their self-efficacy of being able to engage their children in ECE.

Here too, we find that households in Group II and Group III, compared to those in Group I, were more likely to report that they would continue to engage in ECE activities with their child when schools reopen, or if the content stops being sent to them.

27.7% of Group I households reported being "highly likely" to continue engaging in ECE at home when schools reopen, compared to 45.5% of Group II households, and 67.9% of Group III households. 23.4% of Group I households reported being "highly likely" to continue engaging in ECE at home even if the content was no longer shared with them, compared to 40.5% of Group II households, and 62.4% of Group III households. See Table 10 in Appendix B.

RESPONSES FROM THE TEACHERS

Teachers in Akanksha schools, and in balwadis where parents were participating in the structured tech program, reported having observed an improvement in parental engagement that they attributed to the tech program. Teachers reported that parents have become more responsive and were allocating more time towards their child's education due to content shared through the program, with over 40% of teachers across the sample noting that due to the content shared through the tech program, children and parents are excited, regular, active and motivated to engage in ECE activities. Teachers also observed that parents have a better idea of how to conduct and engage in activities with their children, which could influence their willingness to continue engaging.

[17] For the purpose of maintaining brevity in the text, results that rely on conditional regression models are reported as raw differences between groups (and not coefficient), and we highlight only those indicators where differences are statistically significant at the 5% level (i.e. $p<0.05$). Regression tables are provided in the annexure, and complete tables can be provided on request.

[18] Households could respond that they were "highly likely", "somewhat likely", or "not likely at all" to continue engagement with their children.

C.3) Role Of Tech And Teacher Support Programs In Parental Engagament During COVID-19

> ***"The increased response that we have received from the parents since the Rocket Learning program was not present when the schools were functioning regularly. If this program continues after schools reopen it can help maintain that connection of teacher-child-parent and help the child learn meaningfully."***
>
> - Balwadi Teacher

Teachers pointed to various aspects of the program as possible reasons for the above. Many suggested that the use of the low-tech and familiar platform WhatsApp likely helped parents overcome hesitancy over the use of technology, and the short videos shared did not take up too much data and were easily downloadable.

Secondly, many suggested that the play-based and interactive content shared through the tech program was liked by most parents and children, motivating them to engage in activities. They further highlighted that the content was easy to understand for parents and children, especially because videos featured an adult performing educational activities with a child, showcasing the activity and methods for conducting the activity properly. Most teachers felt that the incentive model built into the tech program also motivated many parents and children to engage. Teachers also felt videos largely featured only such materials that parents would have readily available in their homes, minimizing the need to invest in educational materials for ECE.

Finally, teachers suggested that the structured tech program helped ease their workload, especially by minimizing the efforts required in creating and curating digital content appropriate for ECE. Some teachers even said they had learned new methods of teaching fundamental concepts and skills through these videos.

Over and above the tech program, however teachers pointed to ways in which their interactions with parents were able to further alleviate barriers that might prevent parents from engaging in their child's education.

These aspects of the studied ECE programs are discussed in greater detail in the following section.

C.4) Mechanisms For Enhancing Parental Engagement

Data from households and from teacher interviews point to the efficacy of both the studied structured tech program, as well as the structured teacher support program in enabling higher parent and child engagement levels in ECE during school closures, for those households who were able to access digital education. In this section, we highlight aspects of the studied ECE programs that were able to support teachers in performing their job roles, as well as enhance parental engagement directly.

ALLEVIATING BARRIERS TO PARENTAL ENGAGEMENT

In understanding the mechanisms behind how these programs were able to achieve increased parental engagement, we gauge their ability to alleviate the barriers that prevent parents from engaging in and supporting their children's education, specifically for ECE.

Through teacher and parent perceptions of the studied ECE programs we highlight aspects of the program design that address barriers of –

1. Low self-efficacy of parents in the use of technology;
2. Low motivation to engage in ECE;
3. Lack of knowledge and self-efficacy on methods to facilitate learning;
4. Access to prerequisite materials; and
5. Lack of prioritization of ECE, due to financial and emotional stressors associated with the COVID-19 pandemic

Low self-efficacy of parents in the use of technology

Parents, especially from low-income households, often lack self-efficacy and confidence in the use of different technologies for remote learning (Povey, et al., 2016). Studies have also found teachers being unfamiliar and under-confident about the use of technologies for teaching during the pandemic in India (Kim, 2020). This becomes a crucial barrier to overcome in the context of COVID-19 induced school closures, but also has implications for populations that might benefit from remote learning even once schools reopen.

In Section 1 of this report, teachers confirmed that they and parents across the sample preferred the low-tech and familiar platform of WhatsApp, over new technologies of Zoom or Google Meet that were used for live classes. WhatsApp is a no-cost technology that is popular in India and is designed to be used on smartphones, which are the primary device accessible for low-income households.

Teachers across the sample suggested that the structured tech program likely enabled parental engagement by using a low-tech platform like WhatsApp, which was familiar to many families with access to smartphones. About 43% of households reported that WhatsApp was "good to use for education during the pandemic", further corroborating this.

In Akanksha schools, where teachers insisted on the use of live classes despite discomfort with the technology, teachers were trained on the effective use of the technology, and further conducted training for parents to acquaint them with their use for live classes.

This practice then suggests that while we should aim to leverage familiar, low-tech, and low-cost technologies for engaging parents in education, providing appropriate training on the effective use of technologies is crucial.

Low motivation to engage in ECE

The low motivation to engage in ECE among households could be rooted in a variety of factors. Priority afforded to children's education likely determines parental engagement, which in turn is determined by their perception of the importance

of such engagement, and how it might influence the learning and development of their children.

Section 2 of this report highlighted that under-resourced households prioritize the education of their elder children over younger children when forced to make decisions about the allocations of educational resources between children. Establishing the importance of ECE for the future of children's learning is thus probably a crucial factor to encouraging the prioritization of ECE within households.

Engaging and interactive content, that was easy to understand

Teachers suggested that parents were spending more time engaging with the content, which they also observed in parents' increased responsiveness in reaching out to teachers if they did not understand something. Teachers said that this increase in motivation and responsiveness of the parents across the two groups of schools can be attributed to the ease with which the parents were able to understand the digital content shared under this program. 55.8% of teachers from balwadis and 71.4% of teachers from Akanksha schools stated that the material was easy to understand, interesting, and interactive for parents and children.

Teachers suggested that parents and children enjoyed the content due to the play-based and interactive nature of the activities shared. This was substantiated by 58% of households participating in the tech program (Group II and Group III) who reported they engage with the digital ECE content because they (parents) find the content interesting, while 80% of them reported engaging with the program because their children liked the content.

Teachers across the sample appreciated that the content took a holistic approach to ECE delivery - with a focus beyond formal literacy and numeracy. They suggested this will likely have positive effects on the physical, mental, and emotional development of children, while also benefiting children's linguistic and cognitive development. Some teachers specifically appreciated that content included domains such as gross-motor skills, which is often lost in remote learning.

Structured teacher support for engaging in digital content

Despite the apparent ease of the content shared, teachers reported providing support to help parents understand the content, where necessary. Teachers across the sample reported clearing doubts of parents with the use of the digital content and provided additional instruction to parents to engage their children in ECE.

Teachers in Akanksha schools used the multiple planned parent-teacher interactions, such as weekly live classes and monthly parent-teacher meetings, to clear doubts of parents, while also encouraging parents to reach out to them with doubts outside planned hours. Further, practices of sharing pre-recorded lessons prior to live lessons also encouraged parents to engage with the content before live classes where they could raise doubts. The benefit of such practices could be reflected in the fact that only 3% of Group III households reported that they did not understand the content, compared to around 10% of households in Group II and Group I.

Importance of incentives

The tech program's incentive model was also cited as a reason why parents might be encouraged to engage regularly. While some teachers reported that they disagreed with using incentives to engage parents rather than developing a long-term commitment to the child's education, teachers across balwadis and Akanksha schools were in consensus that the incentive model had encouraged parents and the children to participate in educational activities. Households corroborated this, with 44% citing that the incentive model is one of the main reasons that they engaged with the program. Teachers further shared incidents where if the weekly report cards were delayed, parents would worry about it and seek updates from the teachers until they received them.

Lack of knowledge and self-efficacy on methods to facilitate learning

A lack of knowledge about methods to effectively engage and facilitate children's learning (Taylor & Wright, 2019), (Dighe & Seiden, 2020) , and especially for remote learning, might prevent, many parents from engaging in their children's

education. Especially in the context of low-income Indian households, many parents themselves are unlikely to have attended pre-schools or have older children who attended pre-schools.

Schools often assume that parents are familiar with engaging with teachers in meaningful ways, leading to the systematic exclusion of certain groups of parents, including low-income households (Lee & Bowen, 2006). There is also evidence to the point that children with less educated and economically worse-off parents are less likely to receive learning support at home, compared to their better-off counterparts (Brossardi, et al., 2020).

It is crucial thus to recognize that parents are not educators and must be educated and trained on appropriate methods for facilitating their children's learning. The following aspects of the structured tech and structured teacher support programs proved effective in this light.

Tech program targeted parents, not the child

In the case of the studied tech program, teachers reported that the content is designed to address parents (does not provide instruction to children directly), and thus is very helpful in engaging parents. This is an important innovation of the tech program where videos of activities shared with parents feature an adult and a child, with the former instructing the child to perform an educational activity. The video then asks parents to recreate the activity with their own child in a similar manner. The presentation of ECE activities in this form shows parents how to conduct the activity with their children in a proper manner.

Structured teacher support for learning methods of engagement

Teachers played a crucial role in ensuring parents understood the content shared and learned methods for facilitating the learning of their children. When asked to describe the kind of educational support teachers provided them, as well as the topics they discussed with teachers when interacting with them during school closures, only 9.2% of the total sample said they had not interacted with teachers of their child during COVID-19. Across the sample, 79.1% of households reported teachers provided instruction on how parents should teach their children, 63.3% reported discussing challenges faced in teaching their children and clearing doubts where they could not understand the content, and 16.4% reported that teachers provided suggestions on improving children's learning experiences at home. Non-interaction with teachers was higher for Group I households at 16.3%, and much lower at 6.11% for Group III households (enrolled in Akanksha schools).

Group III households (enrolled in Akanksha schools), might have benefited from the structured approach to parent-teacher interactions. In Akanksha schools, similar to the practice of "parent's classes" followed prior to the pandemic, teachers would instruct both parents and children on key concepts, and guide parents on how to teach their children at home. Having already established this practice in physical schools, during school closures Akanksha schools required only to modify or adapt these parents' classes for digital modes of instruction and increased their frequency from fortnightly to weekly. Teachers would further call or send voice notes to parents unable to attend live lessons.

Further, teachers in Akanksha schools described planning lessons and activities ahead of time and informing parents of the same to increase their preparedness for lessons. For example, to enable the effective use of live classes, teachers shared pre-recorded lessons over WhatsApp with parents prior to the live lesson and asked parents to engage with the lesson before attending the class. This allowed parents to familiarize themselves with the concepts that would be taught in the live class, conduct some activity with their child prior to attending the class, and note down doubts they might have had in understanding the content or method of engagement. Where parents (and children) were expected to engage in activities during the live classes (along with the rest of the class), teachers shared information about materials that would be required for the activity a day in advance.

Similarly, teachers also supported parents in engaging with the structured tech program, by clearing doubts of parents on the content shared, providing suggestions for alternative materials required for an activity if they were not available to a household, participating in the incentive model of the tech program, and solving any other grievances of parents related to the program. Some teachers also reported using the tech program as a revision exercise for parents and children, supplementary to the primary teaching they provided during live lessons. As such, not only did they align the tech program with the existing content planned for their students, but also supported the program to encourage parental engagement with it.

Access to prerequisite TLM

As highlighted in this report and in literature, the primary barriers to parental engagement are often socio-economic disadvantages of households that limit access to educational teaching and learning materials (Hollingworth, et al., 2011; Hornby & Lafaele, 2011; Hohlfeld, et al., 2010) including devices and internet connectivity during school closures (Shah, 2020; Azim Premji Foundation, 2021). As seen in section two of this report, the most economically disadvantaged households were also less likely to have invested in educational resources.

Contextually appropriate content

Given that the target population of the studied ECE programs were low-income households, teachers emphasized the importance of the content being contextually appropriate, to increase the likelihood that children would be familiar with objects and materials referred to in the content. For example, a teacher in an Akanksha school cited the one-off example of an activity where the content was not contextually appropriate. In this activity, the child was required to turn on and off a tap. She claimed that a few parents, not having a tap in their home, had complained that their children became demotivated on not being able to do the activity.

Making content contextually appropriate can also increase the likelihood that households might already have these materials at home, and minimize the need for monetary investments in procuring materials that might place a financial burden on households.

Most teachers agreed that the content of the structured tech program was contextually appropriate most of the time, which enabled parents to engage. Further, they suggested that the fact that most of the activities shared under the program can be carried out using home-based materials helped keep parents motivated or rather not become demotivated due to the unavailability of materials. Substantiating this, 89% of the sample reported that materials needed to conduct ECE activities shared with them are usually available at their home.

Structured teacher support in accessing educational materials

Here too, teacher support seemingly enhanced the benefits of the digital program. Households had reported that teachers sometimes provided them with materials that they did not have, while some teachers mentioned offering suggestions for alternative materials from within the home that parents could use to engage in activities.

Socio-economic background of households creating barriers to access and engagement

Further, during COVID-19 households were found to face increased mental health challenges and stress (Gerard, et al., 2020) (Gonzalez, et al., 2020) (Patrick, et al., 2020). This likely deter their ability to provide a, *"nurturing and stimulating learning environment"* within the home and further compromise their ability to prioritize, invest in and meaningfully support their children's education (Gerard, et al., 2020); (Brown, et al., 2020)

As described in previous sections of this report, households in our sample faced mental and financial distress during the pandemic. Even those with access to educational resources struggled to create time to teach their children while navigating other paid and unpaid work responsibilities and the stressors of loss of jobs and incomes which affected them the most during the COVID-19 pandemic. This is especially true where parents need to invest time to educate themselves before they are able to educate their children.

C.4) Mechanisms For Enhancing Parental Engagement

Structured non-educational support to households

Teachers across the sample acknowledged the need to support households during this time, to provide emotional support, and attempt to alleviate some of the stressors that were preventing them from prioritizing ECE. 44.7% of households reported that they received rations and other essentials duringthe pandemic from their teachers or schools, while 78.9% reported receiving information about COVID-19 from their teachers. 30.5% of households reported that teachers provided support for households' mental well-being.

More households in Group III (enrolled in Akanksha schools) reported receiving emotional support from teachers at 40.5%, compared to around 20% among those attending balwadis. This might be once again rooted in the fact that Akanksha schools took a structured approach to provide non-educational support compared to balwadis, where such support was provided on the initiative of individual teachers or organisations. More importantly, Akanksha teachers also had an established institutional support system that provided similar support prior to the pandemic.

In Balwadis: Teachers were often residents of the same areas as parents and students and were actively conducting phone calls, home visits, or calling parents for school visits, to stay in contact with them. Apart from educational support, these interactions were used to talk about the non-academic needs of households, offer support, and spread awareness about COVID-19, and lend an ear to parents undergoing distress during the pandemic. Teachers described discussing financial and other household issues with parents, with many sharing their concerns about not having enough time to teach their children.

In some cases, the organisations running balwadis were also involved in community work during the pandemic, such as helping households to procure rations. Such undertakings however were ad-hoc and on the initiative of individual teachers or organisations running balwadis. Most balwadi teachers also appeared to lack any structured support from institutions (the MCGM or the organisations) to strengthen parent-teacher interaction, or to track down households that could not be reached physically or over the phone. They were assisted by balwadi helpers,[19] whose core responsibility was to assist teachers in conducting home visits and surveys. Teachers and helpers worked in close tandem to ensure regular communication and interaction with parents.

In Akanksha Schools: Teachers reported conducting similar activities as balwadi to provide non-educational support to households. However, they appeared to follow a structured approach to this and were further supported by school administrators and dedicated social workers employed in Akanksha schools.

> ***Parent Engagement continues to be the key pillar of the Akanksha School model. We have observed that Parents from economically disadvantaged backgrounds have significant challenges in different aspects of their life and therefore need sustained training and support to raise healthy and happy children and further to support their children's learning.***
>
> - Akanksha Teacher

All Akanksha teachers described conducting one-on-one wellness or well-being calls with each parent twice a month, as a compulsory component of their job roles during the pandemic. During these calls, teachers would ask parents about struggles they were facing. Teachers were provided a standard set of questions to include during well-being calls to aid in the systematic documentation of issues households might be facing, which was then relayed to School Leaders (SL) and dedicated Social Workers (SW).

'SLs and SWs were embedded in communities in which parents and students resided, and were already familiar with their needs and requirements even prior to the pandemic. They were thus well equipped to mobilize resources and support for households during the pandemic. SLs were tasked with work such as raising awareness about COVID-19 among their communities, while SWs ensured that needs of households such as rations, financial aid, medicines, or TLM (books, worksheets, and even devices) were met. Thus, a

[19] Balwadi helpers could not be directly interviewed as part of this study.

large burden of delivering non-educational support to households did not fall on Akanksha teachers but was operationalized through an institutional division of roles and responsibilities amongst teachers and additional stakeholders.

ALLEVIATING THE BURDENS ON TEACHERS

In our sample, teachers reported longer hours and an increased number of different work roles during the pandemic, including teaching, non-teaching, and non-educational responsibilities. For example, teachers were required to plan curate and create content for digital platforms, re-learn pedagogies for teaching children, teach parents how to teach children, maintain contact with parents through regular reminders, and provide (in some cases) non-educational support such as mental health and emotional support to households. They reported it had become harder to demarcate between teaching and non-teaching roles during the pandemic.

While the nature of roles varied for teachers by school type, they near-unanimously stated that non-teaching responsibilities did not impact their core-teaching role, and instead have aided many aspects of teaching. For example, teachers in Akanksha schools described the routine well-being calls as aiding parental engagement rather than a burden on them, claiming they helped teachers build a rapport and trust with newly enrolled students and parents.

Structured tech program reduced burden of creating and curating content on teachers

The sudden shift to remote or digital education due to the pandemic meant that teachers and schools were unprepared for teaching and learning processes appropriate for digital platforms. This likely meant that teacher's time was directed towards building digital content and designing methods for assessment via digital modes. Further, teachers were also unable to create high-quality content for digital classes, with many believing that the quality of content in digital classrooms fell during the pandemic.

An important benefit of the tech program was reported that it minimized the teacher's role in needing to create and curate content in line with the ECE syllabus and that was appropriate for digital modes of instruction. Teachers reported struggling with creating and curating content for ECE from YouTube videos and other sources.

Where teachers could not find appropriate content, they would create their own pre-recorded videos. Teachers explained that when they would make videos themselves, they would end up being several minutes long, and data-heavy, such that several parents would complain about not being able to download them, or not having the time to go through the whole video with their child. Teachers suggested that the digital program addressed these issues for both teachers and parents, by making short videos that use up less data.

Teachers also suggested that the task of creating and curating content redirected a large part of their time and energy, away from teaching and meeting the learning needs of students. It was thus, near- unanimously stated that the tech program helped teachers significantly by reducing the burden of content creation and curation. Teachers stated that the ready-made materials shared in the program allowed them to focus more on teaching and tracking the progress of children. At the same time, some teachers in balwadis also stated that they had personally benefited from the content shared by the digital program as they had learned new methods of teaching concepts and engaging with children.

Part D) Way Forward

This report presents evidence on the status of ECE eighteen months into the COVID-19 pandemic in India and showcases the varied and crucial roles that parents, teachers, schools and technology have played in the delivery of ECE during this period.

That the loss of development and learning in early childhood is possibly irreversible and can impact future learning capabilities of children (MHRD, 2020), coupled with continued school and Anganwadi closures due to the pandemic, makes ECE a unique and an urgent priority. In this context, the role of parents in continuing the delivery of ECE has been more crucial than ever before (UNICEF, 2020). However, enabling meaningful parental engagement in ECE has the potential to bridge inequalities in learning between children, even when physical schools reopen.

Parental engagement in children's education is seen to greatly improve the learning capabilities of children (Nokali, et al., 2010) (Flavio Cunha, 2006), as well as shows gains for children's social adjustments and behaviour (Nokali, et al., 2010), self-esteem (Goodall & Vorhaus, 2011) and mental health (Jeynes, 2003) (Smith, et al., 2020)

Summary of findings

We study three programs - balwadis (dedicated ECE centres), Akanksha pre-school grades (structured teacher support program), and the E-paathshala program (a structured tech program) - dedicated to the delivery of ECE and facilitating parental engagement during the pandemic. Through this, we document experiences of low-income urban households, and their teachers with digital ECE; and whether and how a "structured tech program" and a "structured teacher support program" was able to increase parental engagement in ECE during the pandemic.

Teachers reported struggles of effectively using digital modes for ECE, and a persistent digital divide that led to a fall in enrolment and regular attendance of students. For households having access to virtual classrooms, several children within a home shared devices, and ECE was not of the highest priority compared to the education of older children.

Despite these challenges, we found that participation in the "structured tech program" (those in Groups II and III) was associated with increased parental and child engagement levels, compared to households not participating in the tech program (those in Group I). Group II and Group III households were also more willing to continue engaging in the tech program once schools reopen, compared to those not participating in the tech program (Group I). Moreover, households participating in the "structured teacher support program" in Akanksha schools (those in Group III) in addition to the tech program, reported the highest parent and child engagement levels, compared to the rest of the sample.

The structured tech program was described as supporting teachers by minimizing the burden of creating and curating digital age-appropriate content. For parents who were able to access the tech program, it reportedly enabled them to overcome several barriers that might otherwise prevent their engagement in their child's education including; hesitancy in use of technology, lack of knowledge about methods for engaging in ECE, and low motivation to engage in ECE.

Not the status quo

The three studied programs however are not the "status quo" for ECE delivery in India, especially when compared to the largest provider of ECE – the Anganwadi system. Anganwadi workers were burdened with various responsibilities beyond ECE, even prior to the pandemic, and have acted as frontline workers during the pandemic. The delivery of ECE was thus, further deprioritized during this time.

A majority of our sample also had access to an internet-enabled smartphone, despite them being relatively disadvantaged compared to the average urban Maharashtra household, possibly due to high penetration in urban settings of Mumbai and Pune. For these reasons, we can expect that barriers to access are far more severe for students enrolled in other contexts, making it critical to explore the delivery of ECE and the experiences of parents and teachers in these contexts.

Despite these limitations, findings of this study can guide interventions in ECE delivery in light of school closures, but also beyond it. Given the landscape of ECE delivery in the country, enabling the prioritization of ECE through parental engagement might show significant gains for children's learning and development in the early years.

Opportunities for blended learning

For those with access to devices and the internet, the use of context-friendly and low-tech educational programs can support parents in learning methods to facilitate meaningful engagement in their children's education, without requiring monetary investments from households.

While parents and teachers unequivocally advocated for the reopening of physical schools for ECE several teachers felt that parts of digital learning could be retained in physical classrooms, through a blended mode of learning. They observed the benefits of continuing some form of the structured tech program with the purpose of sustaining the engagement of parents at home, and as content supplementary to classroom curriculum, even when schools reopen.

Actively engaging parents and caregivers

Within such models, it should be recognized that parents are not trained educators and should be provided appropriate support to learn methods to engage their children and to seek guidance from teachers and schools for the same. Establishing practices and opportunities for meaningful parent-teacher interaction even in physical schools will likely influence the ability of teachers and schools to respond to the educational needs of parents more efficiently. Understanding how parents engage in their child's education, and learning about the resources they might need to support them, is an important factor to inform home-school partnerships (González & Gillanders, 2021). This approach appears to have paid off for households enrolled in Akanksha schools with a long-established practice of treating parents as partners in ECE delivery.

Enabling households to prioritize ECE

Disadvantaged households, who were worst hit by the pandemic, struggled to prioritize the education of their children due to economic and emotional distress. Alleviating some of this distress through providing non-educational support, would be critical to enabling an environment within which parents can prioritize and engage with their children's education. It would be important to ensure institutional support for such efforts, in the form of specific measures for low-income and disadvantaged households and dedicated personnel, to prevent overburdening teachers with additional responsibilities.

Sustainability and scalability

To the questions of sustainability and scalability of similar ECE programs, we cannot forget that access to digital resources for education is a persistent concern. In meetings the needs of these households, similar practices for parental engagement need to be leveraged – frequent parent-teacher interaction, teaching parents methods to engage effectively and providing non-education support (where required) - adapted for physical modes of communication and interaction.

The benefit of the tech program however is that it might lend itself to more cost-effective scalability, while also being less burdensome on teachers. In light of this possibility, teachers provided suggestions for improving the tech program, including making online repositories to minimize the need for storage space on devices and to enable easier access to content. Others spoke to challenges of ensuring regional mediums of instruction are incorporated into tech programs, to enable wider participation.

In our sample, the circumstance of continued schools closures has led to increased engagement of parents in ECE during the pandemic, with teachers wholly relying on this to continue its delivery. Ensuring we are able to sustain such engagement as schools reopen, and identify those who could not engage, requires further exploration of the barriers preventing parental engagement in ECE among varied populations, and methods for alleviating those barriers.

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Appendix A

NOTE 1: Sampling procedure

In sampling households, we had two distinct groups from which to select households – Akanksha schools and balwadis that were participating in the pilot program for the digital ECE model. We aimed to get a list of all enrolled students in balwadis and Akanksha schools that were in the pilot program. Akanksha schools had conducted enrolments for 815 new students to Junior KG grades in their 17 schools. Of these 292 students were enrolled in the 8 schools in Mumbai and the remaining 523 were enrolled in the 9 schools in Pune. A complete list of the contact details of 815 students was provided to the research team, along with basic information of households such as details of their parents, school names, and the ward in which the school is located. **We collected data for 311 households** - 139 enrolled in schools in 7 of the 8 wards in Mumbai, and 172 enrolled in Pune. We attempted to contact all 292 students enrolled in Mumbai schools, and randomly selected a sample of 300 households from the 523 households enrolled in Pune schools.

The research team was also provided with a complete list of teachers employed in the 17 Akanksha schools as Junior K.G. class teachers in Mumbai and Pune. Each Junior K.G. class had two class teachers, of which one was randomly selected for data collection. Across the total of 34, **14 Junior K.G. teachers were interviewed**.

For balwadis we were unable to collect a complete list of students enrolled, as this data was not available with the MCGM. Thus, we relied on the list of phone numbers that had been added to WhatsApp groups (made for enrolment into the structured tech programme) by balwadi teachers. The process of enrolment to the program requires teachers to add the contact details of parents or caregivers of their students to a WhatsApp group. Various errors might occur at this stage of enrolment due to which some students might be missed out. For example, many teachers might not have updated contact details of households. Secondly, in some school settings such as in balwadis, we found there is no clear database of students enrolled, and no database of contact details for teachers to use. During the pandemic this might pose a challenge in reaching out to parents, where many households migrated to rural areas. From a total list of 2617 households, **we collected data for 365 households** located in 24 wards of Mumbai. We first selected a sample of 643 households enrolled in balwadis located within the same 8 wards as Akanksha schools in Mumbai. However, due to a low response rate, the sample was extended to include additional households. We attempted to contact about 1800 households overall.

Sampling of teachers was conducted by selecting teachers from a list of those employed in balwadis and Akanksha schools. Each balwadi employs one teacher and one helper. Since the pilot program was being conducted only in 279 Marathi-medium balwadis, we randomly selected 50 teachers from the list provided. We further reached out to teachers in the 171 Hindi-medium balwadis, where the program was not being piloted. Data was collected from 43 teachers employed in balwadis in Mumbai - 31 in Marathi-medium balwadis that were part of the pilot program, and 12 in Hindi-medium balwadis that were not part of the pilot program. **In total, we collected data for 676 households and 58 teachers.**

While the response rate of households was low across groups, it was considerably lower for households in balwadis. One reason for this could be that Akanksha teachers, who were regularly interacting with households, were asked to inform parents before-hand that they might receive a call from the research team. The research was not able to do the same in the case of balwadi teachers. Another explanation could be with respect to the enrolment of balwadi households on to WhatsApp groups for the digital program. Balwadi teachers reported not having a database on enrolled students and having lost touch with many when the pandemic hit, compared to Akanksha teachers who had an update list of students and contact numbers of their parents. For this reason, it is possible that more errors occurred in enrolling households in balwadis on to the digital program, leading to several incorrect contact details.

Appendix B: Tables

Table 1: Sample Description – Households and Children in the Sample

Household Characteristics	Group I	Group II	Group III	Total
Monthly HH Income prior to Covid-19 in INR (Median)	11000	12000	15000	12000
Mother's Education (%)				
No formal Schooling (%)	13.48	16.07	4.50	10.21
10th and above	34.76	41.52	59.17	48.23
Father's Education (%)				
No formal Schooling (%)	8.51	10.27	2.89	6.51
10th and above	53.20	54.91	58.85	56.36
Social Group (%)				
Gen (Hindu)	7.09	11.61	20.58	14.79
SCST (Hindu)	7.80	5.36	9.32	7.69
OBC (Hindu)	39.72	30.36	26.69	30.62
Muslim	23.40	36.16	33.44	32.25
Others	21.99	16.52	9.97	14.64
Child Characteristics				
Female (%)	53.90	55.36	49.20	52.22
Disability (%)	1.42	0.45	0.96	0.89
Age (Mean)	4.84	5.17	5.22	5.12
N	***141***	***224***	***311***	***676***

Table 2 -Status of ECE Delivery

Modes of Instruction during Covid-19 (%)	Group I	Group II	Group III	Total
Live Online Classes	28.06	48.28	74.11	56.22
WhatsApp Lessons	92.81	86.21	81.88	85.56
SMS Lessons	2.16	7.39	4.21	4.76
Home Visits/In-person Lessons	0.00	0.00	1.29	0.61
N	***141***	***224***	***311***	***676***

Appendix B: Tables

Table 3 - Investment for Accessing Education

	Group I	Group II	Group III	Total
Purchased Smartphone (%)	19.15	20.98	27.65	23.67
Able to access educational materials (%)				
Most of the Time	58.87	53.57	72.99	63.61
Sometimes	29.79	41.52	23.79	30.92
Buy what we don't have (%)	27.66	41.96	39.23	37.72
N	***141***	***224***	***311***	***676***

Table 4 - The Digital Divide within Households

	Group I	Group II	Group III	Total
Prioritize older children's use of device for education (%)	41.13	39.73	53.38	46.30
At least one smartphone with Internet (%)	97.16	97.77	98.39	97.93
N	***141***	***224***	***311***	***676***
Ratio of Smartphones to Children under 18 in the HH				
Mean	0.70	0.86	1.05	0.91
Median	0.50	0.67	1.00	0.67
Total (no. of observations)	***134***	***203***	***293***	***630***

Appendix B: Tables

Table 5 - Socio-economic differences across groups

Asset Ownership (%)	Group I	Group II	Group III	Total
TV with Cable	50.35	65.63	76.21	67.31
Computer/Laptop/Tablet	21.99	54.02	40.19	40.98
Fridge	44.68	72.32	74.60	67.60
Income Shocks during COVID-19 (%)				
Income Decreased during Covid-19	87.94	80.80	79.42	81.66
Fall in monthly income	50.79	26.81	32.71	34.19
N	***141***	***224***	***311***	***676***

Table 6 - Parents Perception on Technology and Type of Interactions with the Teachers?

	Group I	Group II	Group III	Total
Feeling about Teaching-Learning through technology (%)				
WhatsApp is good (compared to other technology)	40.43	43.75	42.44	42.46
Prefer physical classes over digital education	59.57	56.25	57.56	57.54
Reasons to do the educational activities with your child (%)				
Content is good/ interesting	50.00	49.11	66.32	58.67
Child likes the content	80.00	75.45	83.16	79.81
What do you discuss/do when interact with teachers? (%)				
Teacher provides instructions for teaching children	60.28	85.71	82.96	79.14
Teacher asks about our understanding and challenges in teaching the child	50.35	69.64	64.63	63.31
Teachers ask about ours and our child's mental health/ wellness	24.11	36.61	55.95	42.9

I clear doubts on classroom content/ curriculum	16.31	27.23	36.33	29.14
Teacher gives corrections or feedback on child's work	5.67	16.96	21.86	16.86
Teacher offers support/suggestions to make the learning experience better for the child	13.48	16.07	18.01	16.42
Never Interact with teacher	16.31	8.93	6.11	9.17
I give teacher feedback to make teaching better	2.84	3.13	5.79	4.29
Appreciation of the teachers by the parents	3.55	2.68	4.18	3.55
The teacher and I share innovative ideas to make the teaching / learning better	0.71	2.68	2.57	2.22
N	***141***	***224***	***311***	***676***

Table 7 - Receive Additional Support from Teachers

	Group I	Group II	Group III	Total
Receive Additional Support from Teachers (%)				
Provide Materials for conducting activities: books, toys, etc.	16.31	3.13	24.44	15.68
Remedial / extra classes	0.00	12.95	13.50	10.50
Home visits (for teaching, check-ups, etc.)	3.55	4.46	2.89	3.55
They teach me about curriculum (parent's classes)	13.48	22.32	44.05	30.47
Received Non-educational Support (%)				
Support for mental wellbeing of me and my family	14.18	26.79	40.51	30.47
Provide rations, other support during COVID	48.94	40.18	45.98	44.67
Provide information about COVID	56.74	87.05	82.96	78.85
N	***141***	***224***	***311***	***676***

Appendix C: Regression Analysis

Table 1: Parent and Child Engagement

	(1)	(2)	(3)	(4)
	Days received content in the last week	Days engaged in activity in last week	Engaged zero hours last week	Engaged in "all/ most" activities in last week
Group (Reference: Group I - attending balwadis, not participating in E-paathshala)				
Group II (balwadis and E-paathshala program)	0.90***	0.34	0.02	0.01
	(0.27)	(0.29)	(0.05)	(0.06)
Group III (Akanksha schools and E-paathshala program)	0.32	0.44*	0.09*	0.24***
	(0.23)	0.25)	(0.05)	(0.06)
Female	YES	YES	YES	YES
Child's Age	YES	YES	YES	YES
Household Size	YES	YES	YES	YES
Mother's Education Less than 10th grade	YES	YES	YES	YES
Log Monthly Income	YES	YES	YES	YES
General Category Hindu	YES	YES	YES	YES
Ownership of Assets				
Computer	YES	YES	YES	YES
Smartphone with Internet	YES	YES	YES	YES
TV	YES	YES	YES	YES
Lockdown period	YES	YES	YES	YES
Summer Holidays	YES	YES	YES	YES
Constant	2.796***	0.542	0.370**	-0.257*
	(0.68)	(0.74)	(0.15)	(0.14)
R^2	0.15	0.06	0.04	0.10
N	**676**	**676**	**676**	**676**

Note: Significance levels have been calculated using a linear probability model. Standard errors have been clustered at the school level. (*At 10% Level of significance. **At 5% level of significance. ***At 1% level of significance.)

Appendix C: Regression Analysis

Table 2: Parent and Child Engagement (continued)

	(5)	(6)	(7)
	Engaged in "none" of activities shared last week	Hours spent on ECE in last week	Time spent on ECE increased in last 6 months
Group (Reference: Group I - attending balwadis, not participating in E-paathshala)			
Group II (attending balwadis and E-paathshala program)	-0.05	0.00	0.21***
	(0.05)	(0.37)	(0.05)
Group III (attending Akanksha schools and E-paathshala program)	-0.11***	-0.37	0.24***
	(0.04)	(0.35)	(0.05)
Female	YES	YES	YES
Child's Age	YES	YES	YES
Household Size	YES	YES	YES
Mother's Education Less than 10th grade	YES	YES	YES
Log Monthly Income	YES	YES	YES
General Category Hindu	YES	YES	YES
Ownership of Assets			
Computer	YES	YES	YES
Smartphone with Internet	YES	YES	YES
TV	YES	YES	YES
Lockdown period	YES	YES	YES
Summer Holidays	YES	YES	YES
Constant	0.73***	2.03***	0.20
	(0.15)	(0.72)	(0.15)
R^2	0.07	0.07	0.12
N	**676**	**676**	**676**

Note: Significance levels have been calculated using a linear probability model. Standard errors have been clustered at the school level. (*At 10% Level of significance. **At 5% level of significance. ***At 1% level of significance.)

Appendix C: Regression Analysis

Table 3: Willingness to participate in structured tech program in the future

	(1)	(2)
	Continue engaging when schools reopen	Continue engaging if content stops
Group (Reference: Group I - attending balwadis, not participating in E-paathshala)		
Group II (attending balwadis and E-paathshala program)	0.16***	0.14**
	(0.06)	(0.06)
Group III (attending Akanksha schools and E-paathshala program)	0.36***	0.33***
	(0.07)	(0.07)
Female	YES	YES
Child's Age	YES	YES
Household Size	YES	YES
Mother's Education Less than 10th grade	YES	YES
Log Monthly Income	YES	YES
General Category Hindu)	YES	YES
Ownership of Assets		
Computer	YES	YES
Smartphone with Internet	YES	YES
TV	YES	YES
Lockdown period	YES	YES
Summer Holidays	YES	YES
Constant	0.16	0.15
	(0.15)	(0.16)
R^2	0.17	**0.16**
N	**676**	**676**

Note: Significance levels have been calculated using a linear probability model. Standard errors have been clustered at the school level. (*At 10% Level of significance. **At 5% level of significance. ***At 1% level of significance.)

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