



**Parental Engagement in Early Childhood Education During  
COVID-19: Learning from Structured Tech and Teacher Support  
Programs in Urban Maharashtra**

Nisha Pankaj Vernekar  
(Vidhi Centre for Legal Policy, India)  
[nisha.vernekar@vidhilegalpolicy.in](mailto:nisha.vernekar@vidhilegalpolicy.in)

Pooja Pandey  
(Vidhi Centre for Legal Policy, India)

Karan Singhal  
(University of Luxembourg and LISER, Luxembourg)

Aditya Narayan Rai  
(Vidhi Centre for Legal Policy, India)

Avinash Reddy  
(Vidhi Centre for Legal Policy, India)

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# Parental Engagement in Early Childhood Education during COVID-19: Learning from structured Tech and Teacher support programs in Urban Maharashtra

Nisha Vernekar<sup>1</sup>, Pooja Pandey<sup>2</sup>, Karan Singhal<sup>3</sup>, Aditya Narayan Rai<sup>4</sup>, Avinash Reddy<sup>5</sup>

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## Abstract

Low-income countries like India struggled to maintain and revive early childhood education (ECE) during COVID-19 induced school closures. Shifts to remote-learning methods necessitated parental engagement in children's education, which proved difficult in resource-constrained environments. Inequalities in parental engagement and access to ECE were only exacerbated during the pandemic, making the need to explore suitable models for greater engagement an urgent priority (UNICEF, 2020).

This paper studies delivery of ECE in two types of ECE centres in cities of Maharashtra, India, both serving disadvantaged households. In response to COVID-19, both initiated a structured "low-tech" programme through Whatsapp that provided age-appropriate content for 3–8-year-olds in form of bite-sized videos. In addition, one type of centre created a structured "teacher support" programme which included a combination of live classes, "well-being" check-ups, and provisioning of educational materials (such as devices and data recharges), as well as non-educational relief support (such as rations and medicines). We surveyed 676 parents and interviewed 58 teachers between April and June 2021 to gauge the influence of both programmes on enabling parent and child engagement in ECE.

We found that for households who could overcome issues of access to devices and internet connectivity for remote learning, participation in the *tech programme* was associated with higher engagement levels (time spent on educational activities), when compared to households enrolled in ECE centres without access to the tech programme. Access to the *teacher support* programme, in addition to the tech programme, was associated with even better outcomes. Teachers corroborated these findings, reporting that the programme reduced their burden of creating and curating digital content; provided insights on resources and capacity required to deliver education through tech initiatives, and motivated higher engagement and participation of parents during school closures.

*Key Words - Early Childhood Education, Covid-19, Education Technology, Low Income Households, Parental Engagement*

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<sup>1</sup> Nisha Vernekar is Senior Resident Fellow and Team Lead, Inclusive Education at the Vidhi Centre for Legal Policy

<sup>2</sup> Pooja Pandey is Research Fellow, Inclusive Education at Vidhi Centre for Legal Policy

<sup>3</sup> Karan Singhal is a doctoral student at University of Luxembourg and Luxembourg Institute of Socioeconomic Research (LISER)

<sup>4</sup> Aditya Narayan Rai is Research Fellow, Inclusive Education at the Vidhi Centre for Legal Policy

<sup>5</sup> Avinash Reddy is Project Fellow, Inclusive Education at Vidhi Centre for Legal Policy

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## INTRODUCTION

Early Childhood Education (ECE) is one of the most important stages of schooling, recognized for its benefits to development of children across their lifetimes. Children lagging behind in learning during ECE are found to lag behind in later years too (UNICEF, 2020; Silberstein, 2021) and children accessing high-quality ECE, along with nutrition and health in early childhood show gains in cognitive, socio-emotional development and foundational learning (UNICEF, 2012), which increases their future learning (Kaul, 2016) and earning capabilities (Gertler, et al., 2014).

Despite this, ECE received limited priority across the globe during COVID-19 (UNESCO, UNICEF, World Bank, 2020). ECE might have been the least prioritised across different levels of education. As of August 2020, only 60 percent 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). Pre-primary school closures also significantly differed across countries, with high-income countries reporting an average of 46 pre-primary instruction days lost due to COVID-19 in 2020, while low and middle income countries lost twice that or more (UNESCO, UNICEF, World Bank and OECD, 2021).

In the Indian context, while much was said about how COVID-19 impacted other stages of schooling (Shah, 2020; Kundu & Sonawane, 2020; Pandey, et al., 2020; Road Scholarz, 2021; Azim Premji Foundation, 2021), limited evidence was created on status of ECE delivery during the pandemic. One of the only studies conducted on ECE reported that delivery of ECE was taking place at a “lower scale” and “frequency” compared to pre-pandemic (Accountability Initiative, 2021).

Pre-primary school closures deprive children of cognitive stimulation and socio-emotional development, required to fundamentally prepare them for their future course of learning. Beyond the long-term impact on learning, the closure of early education facilities and limited interactions with extended families and peer groups, further deprived children of both social and cognitive stimulation beyond their homes (Yoshikawa et al., 2020).

In India, pre-primary school closures last almost 24 months. For continuance of education delivery, schools were forced to substitute traditional methods of teaching-learning for remote solutions with a renewed reliance of Ed-tech. However, a large part of the country had limited access to devices, internet and other resources required to access remote modes of learning. Early evidence during the pandemic found 60 percent of children (of about 400 sampled households across five states in India) could not access online learning opportunities during the pandemic (Azim Premji Foundation, 2021).

For such resource-constrained contexts, use of low-tech modes of communication, such as SMS text messages or WhatsApp messages have been found to be effective in both, imparting remote learning and bridging some of the digital divide in access to the same (Aker et al., 2012; Angrist et al., 2022; Page et al., 2021; McKnight et al., 2016). Recent evidence from during the COVID-19 pandemic corroborates this. Angrist et al. (2022) found that an intervention carried out in Botswana in the form of SMS messages followed by a phone call, increased learning levels of children. The study further reported 95% of targeted parents and children participated in the intervention.

Disruption of ECE and reliance of Ed-tech, necessitated parental engagement in children’s education, especially for younger age groups (Borup, et al., 2014; Schroeder & Kelley, 2009). Various barriers prevent parents from engaging in education, especially in resource-constrained contexts, for example access to educational resources (Hornby & Lafaele, 2011), time of parents (Ribeiro et al., 2021), and cognitive bandwidth (Mani, et al., 2013).

The combination of school closures and reliance on tech solutions for teaching-learning during the pandemic, made the role of parents in engaging their children in education far more crucial than ever before (UNICEF, 2020), especially for younger age groups (Borup, et al., 2014; Woolfer, 2019;

Schroeder & Kelley, 2009). Various barriers however, prevented parents and caregivers from engaging in education of their children, both during and prior to the pandemic. For example, parents may have limited access to educational resources (Hornby & Lafaele, 2011), time (Ribeiro et al., 2021), or cognitive bandwidth (Mani, et al., 2013), to support their children's education.

This paper studies the role of a “low-tech” programme and a “teacher support” programme in encouraging and empowering parental engagement and in turn student's participation in ECE, among low-income households, during the COVID-19 pandemic in India. We study 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 of Akanksha schools. During Covid-19, both types of schools piloted a structured tech programme called E-paathshala<sup>6</sup>. This programme is currently being conducted in partnership with Ministries of Education and Women and Child Development across five states in India, with a reach of over 1 million children.

While not all balwadis were offered the tech programme, all children attending Akanksha schools were enrolled in the tech program. In addition, Akanksha schools were running a structured “teacher support” programme, designed to provide educational and non-educational support to households in order to enable their engagement in their child's education.

Our sample includes 676 parents and 58 teachers who were surveyed and interviewed between April and June 2021, to gauge the influence of both programmes on enabling parent and child engagement in ECE.

We found that for households who could access the structured tech programme, participation in the program was associated with higher engagement levels (time spent on educational activities). Participation in the structured teacher support program (provided in Akanksha schools) in addition to the tech programme, was associated with even better outcomes. We further find, for example that less educated mothers might require teacher support programmes over and above tech programmes, to encourage their sustained participation (when compared to their more educated counterparts).

Teachers in our sample corroborated findings from the data, reporting that parents became “more responsive” and were allocating more time towards their child's education due to various features of the tech program. This included - the play-based and interactive content, regularity of receiving content, use of materials at home for educational activities, and ease with which content shared could be understood by parents.

This paper contributes to the nascent evidence on the impact of the pandemic on children in the stage of ECE in low-income settings like India. It further contributes to the understanding of the use of low-tech and parental support programmes offered by schools may enable effective remote education in low-resource contexts.

Crucially, while the COVID-19 pandemic might have resulted in the most prolonged period of school closures in recent history, it should be noted that widespread school closures occur routinely, for example in response to extreme weather events and natural disasters, but also seasonally in states that receive heavy monsoons or cyclones. The high frequency in disruptions to education delivery necessitate educational intervention within the home. Thus, learnings from this study are relevant beyond the COVID-19 context in enabling remote education in low-resource contexts in times of crisis and beyond.

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<sup>6</sup> This programme was run in partnership with Rocket Learning - a non-profit Ed-tech organisation in India.

## ***Understanding Parental Engagement in Education***

Even prior to the pandemic, parental engagement in children's education has been found to greatly improve learning capabilities (Heckman, 2012) social adjustments and behaviour (Nokali, et al., 2010), self-esteem (Goodall & Vorhaus, 2011), and mental health (Jeynes, 2003; Smith, et al., 2020). The reliance on ed-tech during school closures however, necessitated engagement of parents and caregivers for continuance of learning of children during the pandemic.

Various barriers however, prevent parents and caregivers from engaging in education of their children. At the household level, socio-economic backgrounds of households continue to be a primary determinant of parental engagement in education. Low-income and less educated households (compared to their better-off counterparts) are less likely to provide support (Ribeiro et al., 2021; Brossard et al., 2020), and to be able to access educational resources for ECE in the home (Hornby & Lafaele, 2011). Finally, engagement might also be determined by perceptions of the importance of parental support for learning, whether their child requires it (Ribeiro et al., 2021), and on knowledge about methods to effectively engage (Dighe & Seiden, 2020).

In context of remote modes of learning used during the pandemic, accessibility of internet and devices (Hohlfeld, et al., 2010; Hollingworth, et al., 2011); low self-efficacy in use of technology (Ribeiro et al., 2021; Povey, et al., 2016); and perceptions about effectiveness of remote modes (Abuhammad, 2020; Dong et al., 2020) might have posed challenges for parental engagement. Further parents of young children reported increased stress levels and suffering mental health since the start of the pandemic (as highlighted by McCoy, et al., 2021; Brown, et al., 2020).

Additionally parent's propensity to invest time in their child's education (Ribeiro et al., 2021) and their cognitive capability to support their children's education might also determine the quality of engagement (Mani, et al., 2013). Finally, parental perceptions of the importance of engaging with their children's education [cite]; their knowledge about how their engagement might influence the learning and development of their children [cite]; knowledge about methods to effectively engage and facilitate children's learning (Taylor & Wright, 2019; Dighe & Seiden, 2020); and finally whether they perceive their child to require such support (Ribeiro et al., 2021), are all important determinants of their meaningful engagement.

Engaging parents thus 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). Additionally, efforts of schools might also determine engagement (González & Gillanders, 2021; Eccles & Harold, 1996).

### **THE STUDIED INTERVENTION:**

***Structured Tech Program:*** In response to school closures, both types of ECE centres piloted a structured low-tech program called *E-Paathshala*<sup>7</sup> between January and June 2021 - a digital intervention that provides structured and age-appropriate content for 3–8-year-olds, following a well-defined curriculum. The program is designed to enable parents and children in low-income and under-resourced settings to engage in ECE at home.

#### **How does E-paathshala work?**

Parents and class teachers are added to WhatsApp groups on which digital educational content - in form of bite-sized videos (of 2-3 minutes and of <5mb to minimize data usage) are circulated daily. Videos are targeted to parents, and show case educational activities requiring materials that should be easily available or can be easily procured by most low-income households. Parents are asked to

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<sup>7</sup> E-paathshala is a programme designed by [Rocket Learning](#)– an India-based non-profit Ed-Tech organisation. As of July 2022, this program is being run in across 10,000 pre-schools catering to over 100,000 students across five states in India.

conduct activities showcased with their child, and share videos or images of the same on the Whatsapp group.

The teacher's role on the group is to motivate parents and children to participate regularly, and provide feedback and incentives on videos shared, in the form of "smiley face" emojis and other words of encouragement. Additionally, weekly "report cards" are shared with parents that show the number of activities completed by them in the week. Finally, compilations of videos shared by parents on the Whatsapp group (of their children participating in the educational activities) are broadcast on local TV channels.

Digital content shared was in Hindi or Marathi medium, based on the balwadi's medium of instruction. In Akanksha schools all content shared was in Hindi medium. During the period of data collection, both balwadis and Akanksha schools had annual summer holidays (between 1st and 31st May 2021). During this period in Akanksha schools, the frequency of E-Paatshala, the frequency of sharing content was reduced from daily to 5 times a week.

### **Teacher Support Programme**

Through interviews with teachers, we find that the studied ECE centres - balwadis<sup>8 9</sup> and Akanksha schools<sup>10</sup> - had devised teacher support programs consisting of both, educational and non-educational support, to enable parental engagement in ECE during the pandemic.

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. Despite dedicated efforts of the studies ECE centres to continue classes, enrollment in virtual classes reportedly 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 inaccessibility of devices and the internet; parents being unable to invest time in their child's education due to work and other care responsibilities; and a lack of priority for ECE within households.

In response to some of these constraints, the studies ECE centres attempted to additionally provide non-educational support to households. The approach taken in balwadis to provide both educational and non-education support however, was dependent on initiative of individual teachers and NGOs, and was mostly developed in an ad-hoc way in response to school closures. This made the approach of balwadis relatively "unstructured" compared to the "structured" teacher support programs in Akanksha schools, where parental engagement programs and community outreach had existed prior to the pandemic, and were only adapted to digital modes during school closures.

#### *In balwadis*

*Educational support:* In balwadis, teachers reported primarily using WhatsApp for regular teaching, communication and instruction for parents and students. Parents of balwadi students having access to

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<sup>8</sup> 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, 819 balwadis are run by 25 different NGOs under this PPP model.

<sup>9</sup> 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.

<sup>10</sup> The Akanksha Foundation 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 of which 17 have Junior K.G classes or pre-school grades, with an enrolment of 815 students, under a PPP model with the municipal corporations of urban Mumbai and Pune. 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/>

internet enabled devices were added to a WhatsApp group along with teachers, the principal, and the administrative officer of the balwadi. Additional modes of teaching reported by some included live classes and home visits. Balwadis teachers cited the following responsibilities as part of providing educational support to parents - curating or designing digital content, sharing content with parents, following-up with parents to complete activities, and responding to parents on WhatsApp groups when they completed work<sup>11</sup>.

*Non-educational support:* In some cases, balwadi teachers reported helping households to procure rations and medicines. Such support offered however was ad-hoc and on the initiative of individual teachers or NGOs running balwadis.

### *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 including planning content as per the curriculum and parent-teacher interactions. Teachers described using E-Paathshala content on Whatsapp, and creating and curating some additional digital content to supplement the program. In addition they reported using both synchronous and asynchronous platforms extensively. Live classes of 40 minutes each were conducted on Zoom at least two days a week across all Akanksha schools, and up to five days a week in some cases.

On parent-teacher interactions, they described adapting a program of “parent’s classes” which was conducted fortnightly in schools prior to the pandemic. These were adapted to weekly zoom calls, wherein teachers taught parents how to teach their children and cleared their doubts about the content and assignments shared.

*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. During the pandemic, teachers held fortnightly one-on-one “well-being calls” with parents, to provide moral support and document any urgent needs for rations, medicines, or resources for education (such as internet recharges). These were then relayed by teachers to social workers, who would try to meet these needs.

Based on qualitative interviews from teachers in both types of ECE centres, we categorize the approaches taken by balwadis as relatively “unstructured teacher support” compared to the more “structured teacher support” provided to households enrolled in Akanksha schools.

## **STUDY DESIGN:**

In January 2021 (almost a year since schools were closed due to the COVID-19 pandemic), all Akanksha schools (17 across Mumbai and Pune) and 279 Marathi-medium balwadis in Mumbai, piloted the structured low-tech program, ‘E-Paathshala’. Since completion of the study, this program has been implemented across all 819 balwadis run by the Municipal Corporation of Greater Mumbai (MCGM). At the time of data collection however, while all Akanksha schools had enrolled their students into the E-Paathshala program, only some balwadis had enrolled their students. The nature of teacher support and the tech program are described in detail in the section below.

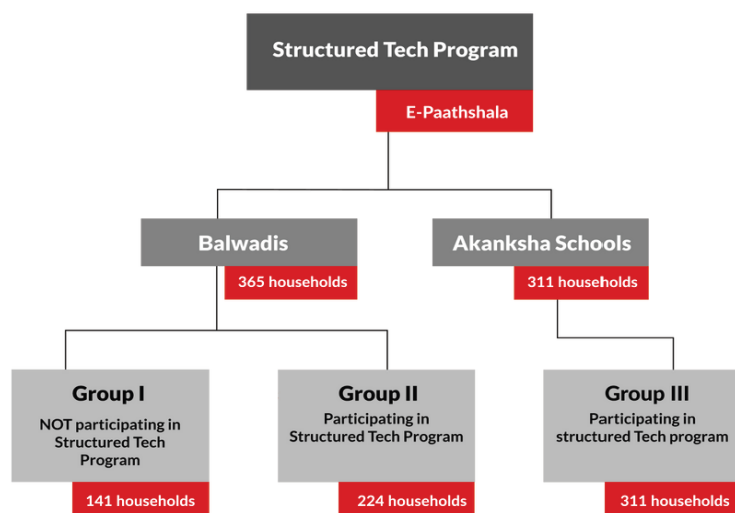
As a result, households sampled could be divided into three groups based on their enrollment into the two types of pre-schools and into the E-Paathshala program (structured tech program), and thus the nature of teacher and tech support they were receiving at the time of data collection. Group I consisted of households enrolled in balwadis and not enrolled in the structure tech program, Group II consisted

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<sup>11</sup> In addition, some teachers also contacted households not just on digital platforms but also through phone calls, home visits, and by calling the parents to schools to pick-up worksheets and assignments.



of households enrolled in balwadis and in the structured tech program, and Group III consisted of households enrolled in Akanksha schools, all of whom were enrolled in the structured tech program.



Source: *Starting from Scratch | Role of Parents, Teachers and Tech in Early Childhood Education during COVID-19* (Vidhi Centre for Legal Policy, 2021)

## Data

We surveyed 676 households enrolled in Akanksha schools and balwadis in Mumbai and Pune, and conducted in-depth interviews with 58 Akanksha and balwadi teachers. Data was collected over three months, between April and June 2021. This time period coincided with the peak of the second wave of COVID-19 in Maharashtra, and almost completely overlapped with the second lockdown in the state.

As a result, all surveys, initially designed for in-person data collection, were adapted for and administered telephonically. Surveys were translated to and conducted in two languages - Hindi or Marathi - based on the preference of the respondent. Similarly, interviews with teachers were conducted in three languages - Hindi, Marathi or English. Surveys and interview schedules were translated into Hindi and Marathi by certified translators, and back-translated by a third-party.

Surveys of households captured their background characteristics, which included their social and economic characteristics prior to and since the pandemic, and educational status of all children residing in the household at the time of data collection. Additionally, we capture the level of engagement with ECE of parents and the sampled child, which acted as the variable of interest. Finally, we asked open-ended questions about what motivated parents to engage, or what dissuaded them from engaging in ECE, and their experiences of the structured tech program or with digital education more broadly.

Sampled teachers were asked questions about their experiences shifting to digital modes of instruction for teaching, using the structured tech program, and about institutional or individual approaches they have adopted to motivate parents to engage in ECE in the home.

## Sampling Strategy

Sampling of Households: Households were selected from a list of students enrolled in two distinct ECE centres – Akanksha schools and balwadis. Sampling strategies for both types of schools differed based on the information publicly available and/ or provided to the research team.

Akanksha schools had conducted enrolments for 815 new students in Junior KG grades in their 17 schools for the academic year 2020 - 292 in 8 schools in Mumbai, and 523 in 9 schools in Pune. A

complete list of the contact details of the 815 students was provided to the research team, along with basic information of households such as school names, wards in which schools were located, and background information and contact details of parents. We attempted to contact all 292 households enrolled in schools located in Mumbai, of which we were able to collect data from 139 households. From the list of 523 students enrolled in Pune schools, we randomly selected 300 households, of which we collected data from 172.

In balwadis, a complete list of students enrolled was not available with the MCGM. As a result, we relied on a list of phone numbers compiled for enrollment of students into the structured tech program, which required balwadi teachers to add parents of their students to Whatsapp groups created by them, on which digital content of the program would be shared. Of the total list of 2167 households, we were able to collect data for 365 households (out of attempt to reach 1800 households).

The attrition rate of households from those initially sampled to those from whom data was ultimately collected was considerably high. A major factor in this could be because the period of data collection almost completely overlapped with the peak of the second wave of COVID-19 in Maharashtra and the resulting lock-down in the state<sup>12</sup>.

Secondly, while the sample excludes those we were not part of the original list or those who could not be connected telephonically, we collected detailed information about backgrounds of available households to factor these in during analysis and contextualise our findings better. More on this has been discussed in later sections.

Sampling of Teachers: Qualitative interviews were conducted with 58 teachers - 43 employed in balwadis and 15 employed in Akanksha schools.

In Akanksha schools we were provided with a complete list of the 34 Junior KG teachers, - two per Junior KG class. We attempted to speak to one of the two class teachers per school, selected randomly, of which interviews were conducted with 14 Junior K.G. teachers.

In balwadis, we attempted to select teachers from balwadis that were part of the pilot program, and some in balwadis not part of the pilot program. We first selected a random sample of 50 balwadi teachers employed in the 279 Marathi-medium balwadis, of which interviews were conducted with 31 teachers. We then randomly sampled 30 teachers from 171 Hindi-medium balwadis (where the program was not being piloted), of which interviews were conducted with 12 teachers.

## **Empirical Strategy**

The objective of the study was to assess whether receiving the structured tech and teacher support programs was associated with higher engagement of households in ECE. The outcome variables captured - frequency of content shared; frequency of parent and child engagement with content; time spent on education in the week prior to data collection; increase in time spent since the start of the tech programme; and households' willingness to continue participating in the program (even once schools reopen and if content was no longer shared with them).

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<sup>12</sup> Households in distress were much less likely to participate in surveys. Surveyors hired for data collection were also impacted by the pandemic directly or indirectly, resulting in some dropping-out temporarily or permanently in between the period of data collection. For this reason, the period of data collection itself was extended from 45 days to approximately 90 days, and required the research team to conduct repeated training with surveyors. Secondly, while response rates of households was low across the three groups, it was considerably lower for households enrolled in balwadis. A possible reason for this could be that Akanksha teachers were regularly interacting with households and informed parents about the research study before-hand. The same could not be done in the case of balwadis. Another explanation could be because the MCGM did not have an updated and complete list of enrolled students', sampling from balwadis was done with reference to the enrolment of balwadi households into the pilot tech program, which might itself have various errors of exclusion. For example, the list of numbers compiled for this purpose would only include parents having internet-enabled smartphones that are compatible with Whatsapp.

The explanatory variable of interest is the type of school and intervention the household is associated with -- Group I (enrolled in balwadis and not participating in the tech program), Group II (enrolled in balwadis and participating in the tech program), or Group III (enrolled in Akanksha schools that have a structured teacher support program, and participating in the tech program).

Since the selection into the programme and/or our sample may not have been random, we account for differences in socioeconomic background characteristics across these groups through a standard conditional linear regression model. Control variables include - gender and age of the sampled child; household size; highest education level attained by the mother of the child; monthly household income; occupation of the household head; religion and caste group of households; whether any child in the household (apart from sampled child) had attended a preschool; and ownership of a computer, smartphone with internet, or TV. Additionally, we control for whether data was collected during the COVID-19 lockdown in the state, and during the one-month summer holiday for Akanksha schools (where frequency of digital ECE content was reduced and live classes were not being held<sup>13</sup>). Standard errors are clustered at the school or balwadi level.

In the following section, we first present descriptive statistics on socio-economic background variables, and the variable of interest, across the three groups of households. This is followed by regression results.

However, despite accounting for these differences – non-random selection into programmes and our sample – the variable of interest may not capture the efficacy of the interventions vis-à-vis the outcomes, due to endogeneity bias. Thus, to further understand the efficacy of the interventions and its mechanisms, we utilize data collected through open-ended questions with parents about the interventions, as well as in-depth interviews with teachers.

## **RESULTS**

### **Background of households**

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). See Table 1 for more details.

#### **[Table 1 here]**

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.

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.

Median household incomes in our sample were reported as INR 12,000 per month, earned 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

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<sup>13</sup> During the period of data collection, both balwadis and Akanksha schools had annual summer holidays (between 1st and 31st May 2021). For this reason, only in Akanksha schools, the frequency of E-Paatshala content was reduced from daily to 5 times a week.

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.

However, the entire sample, on average was more disadvantaged than the average urban resident in Maharashtra<sup>14</sup>. About 48% of mothers and 56% of fathers in our sample 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).

### **Parent and Child Engagement in ECE**

We first present ‘raw’ differences on parental engagement outcomes across three groups in Table 2. Then we compare households in Groups I, II, and III on all outcomes through a multivariate linear regression model<sup>15</sup>, controlling for key demographic and socio-economic indicators that we found to differ across the three groups (as presented in the section above).

[Table 2 here]

Group II and Group III households – who were participating in the structured tech program – were more likely (compared to Group I households) to report; receiving content on more days (in the “last week”); higher parent and child engagement levels; having increased time engaging in educational activities (since the start of the tech programme); and willingness to continue the program. These differences persist even after accounting for socioeconomic and demographic indicators.

[Table 3 here]

Group III households – who received both structured tech and structured teacher support – were significantly more likely to have spent more days on ECE (in the “last week”) and to report engaging in “most or all” of the educational activities shared with them, even when compared to Group II households (who participated in the tech programme, but had “unstructured teacher support”).

Average hours spent on ECE engagement (in the “last week”) however, did not significantly vary across groups.

To further understand the efficacy of the programmes, we interact the intervention type with an important driver of parental and tech engagement - mother’s education levels (Ribeiro et al., 2021; Brossard et al., 2020). We find that more educated mothers (those who completed 10<sup>th</sup> grade or above) have a higher likelihood of wanting to continue the programme (“once it stopped” or “once schools reopened”) – this is true for mothers in both intervention Groups (II and III).

### **Did the programme “work” and what components drove engagement?**

Although we are unable to address selection issues and endogeneity concerns in the model, we corroborate these findings by drawing from in-depth interviews with teachers. Insights from teacher

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<sup>14</sup> On the other hand, it should be noted that given the sample is selected from two of the largest cities in the state, sampled households are likely to more advantaged than the majority of the country, even in access to programmes such as those under study.

<sup>15</sup> For the purpose of maintaining brevity in the text, we highlight only those indicators where differences are statistically significant at the 5% level (i.e.  $p < 0.05$ ). Raw differences are available in Table 2 and regression results are available in Table 3. Complete tables can be provided on request.

and parent interviews highlighted multiple possible factors at play - mode of delivery, type of content, resources and capacity required to do the activities.

Teachers working in ECE centres implementing these programmes observed an increase in parental engagement and suggested the tech programme nudged parents to become “more responsive” - evidenced by a higher responsiveness from parents in reaching out to teachers for feedback and clarifications, and inquiring about future content.

Teachers suggested that the use of a familiar platform like WhatsApp likely minimized parent’s hesitancy with technology. Further, content sent to parents was in the form of short videos that were easy to download and did not require substantial internet bandwidth.

Several teachers emphasised on the quality of content being a major factor that drove parental engagement. The content shared was interactive, play-based and was simple to understand, and was praised for being more holistic (“beyond only basic literacy and numeracy”). More than 55% teachers in balwadis and over 70% teachers in Akansha school felt the material was “easy and interactive” for parents. Similarly almost 60% of parents participating in the programme engaged with the content because they found it “interesting”, and encouragingly, 80% said their children liked the content.

Teachers also praised content for only featuring materials and resources that are already available at home (minimising need for parents to spend money), while almost 90% of households participating in the tech programme reported that materials for activities were available at home.

They also suggested that because the digital content featured an adult conducting an activity with a child and they were easy to understand for most parents, the videos taught parents how to conduct these activities with their own child. They suggested this may explain the willingness of many to continue engaging in the programme even after schools reopen.

Teachers also highlighted the role of incentives (report cards, smiley faces) nudging parents to do more activities. Over 40% of the households cited these incentives as a significant factor in their regularity in the programme. While some teachers felt a little concerned about the long-term implications of this, they also considered it as an important driver in keeping parents engaged and excited about the content.

Finally, teachers also said that the programme eased their workload by providing curated digital content during school closures. Some explained how it helped them build their own capacity to teach remotely, and informed them of new ideas and methods for teaching concepts. This is significant, since teachers, especially in Akanksha schools, played a central role in ensuring parents were doing the activities and were constantly available for feedback and support - including providing them forums like live classes and parent teacher meetings to discuss and seek clarifications regarding the activities. Thus, unsurprisingly, these practises may be the reason why fewer parents in these groups report not being able to understand the content (only 3% compared to more than 10% in the other groups).

## **DISCUSSION AND CONCLUSION**

Investing resources in ECE is critical because loss of learning and development during early stages is irreversible (MHRD, 2020). The current inequalities in parental engagement and access to ECE have only been further exacerbated by the COVID-19 pandemic, making the need to address these issues and explore suitable models an urgent priority (UNICEF, 2020).

Our survey findings point to the potential of contextually appropriate low-tech content and teacher support to improve engagement for those who are able to participate in these programmes. However, they also highlight the deepening of existing inequalities by revealing the lack of parental engagement

for early childhood education during COVID-19 induced school closures, and limited resources among the disadvantaged.

We find that participation in the structured low-tech programme was associated with higher parental and child engagement levels compared to those who accessed an unstructured programme. There was also more willingness among those accessing the structured tech programme to continue engaging in the programme even after reopening of schools/centres. Those having access to a structured teacher support programme in addition to the structured tech (in Akanksha schools) reported even higher parental and child engagement levels compared to the rest. These findings are largely corroborated by drawing from in-depth interviews with teachers.

Findings of this study highlight the potential of contextually appropriate low-tech educational content and teacher support, in improving parent and consequently child engagement in ECE. Analysis of data from households and teachers revealed that for parents who had access to devices, the tech programme might have helped alleviate several barriers like low motivation levels, poor knowledge regarding learning and teaching methods, and low self-efficacy in use of technology, which usually hinder parental engagement during the early childhood period. The observed premium in engagement levels for those receiving structured teacher support also revealed the criticality of non-educational support in the form of counselling, relief provisions (such as food) and educational resources, in times of crises.

These aspects and their efficacy for under-resourced contexts must be further explored - especially given that the studied programmes do not reflect the status-quo of ECE delivery in a large part of India<sup>16</sup>.

The findings of this study assume even greater significance in the context of the recent National Education Policy (MHRD 2020) in India that emphasises the need to formalize ECE across the country. State and district governments must make investments to understand the gaps and capacity of parents, children and teachers to design programmes suited to these contexts.

While the role of teachers in the success (or even implementation) of any educational intervention is always recognised, it must be ensured that these programmes do not increase their burden. Ensuring this will be critical to sustain such initiatives, especially when the average government teacher or other ECE educator does not only face substantial administrative burdens but works in contexts where they often feel undervalued (Ramachandran 2020).

Alleviating barriers of parental engagement have the potential to not just improve learning abilities and school readiness of the child, but also development of children more holistically. This is only possible if efforts are made to understand the resources and context of parents and children in their homes.

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<sup>16</sup> Most low-income households rely on the '*anganwadi system*' which suffers from low instructional time on ECE due to its other commitments related to health and nutritional services (Gainiman et al. 2021).

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## TABLES

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

Households Characteristics	Group I	Group II	Group III	Total
<b>Monthly HH Income prior to Covid-19 in INR (Median)</b>	11000	12000	15000	12000
<b>Asset Ownership (%)</b>	<b>Group I</b>	<b>Group II</b>	<b>Group III</b>	<b>Total</b>
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	74.6	67.6
<b>Mother's Education (%)</b>				
No formal Schooling	13.48	16.07	4.50	10.21
10th and above	34.76	41.52	59.17	48.23
<b>Father's Education (%)</b>				
No formal Schooling	8.51	10.27	2.89	6.51
10th and above	53.20	54.91	58.85	56.36
<b>Social Group (%)</b>				
Gen (Hindu)	7.09	11.61	20.58	14.79
SCST (Hindu)	7.8	5.36	9.32	7.69
OBC (Hindu)	39.72	30.36	26.69	30.62
Muslim	23.4	36.16	33.44	32.25
Others	21.99	16.52	9.97	14.64
<b>Prior experience with pre-school</b>				
<b>Child Characteristics</b>				
Female (%)	53.9	55.36	49.2	52.22
Disability (%)	1.42	0.45	0.96	0.89
<b>N</b>	<b>141</b>	<b>224</b>	<b>311</b>	<b>676</b>

**Table 2: Outcome Indicators of Parental and Child Engagement**

	<b>Group I</b>	<b>Group II</b>	<b>Group III</b>	<b>Total</b>
Days receive content (Mean)	3.78	4.96	4.22	4.37
Days engaged in content (Mean)	2.70	3.22	3.29	3.15
Time spent on ECE increased in last six months (%)	9.93	34.38	32.48	28.4
<b>Parent-child Engagement across indicators</b>				
Engaged in All/Most content in last week (%)	27.66	35.27	53.05	41.86
Engaged in None of content in last week (%)	26.95	22.32	17.36	21.01
Engaged on zero days in last week (%)	25.53	24.11	17.36	21.30
<b>Households will continue programme</b>				
When School reopen	27.66	45.54	67.85	52.07
When programme stops	23.40	40.63	62.38	47.04
<b>N</b>	<b>141</b>	<b>224</b>	<b>311</b>	<b>676</b>

**Table 3: Parent & Child Engagement, and continuance of programme**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	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	Engaged in "none" of activities in last week	Hours spent on ECE in last week	Time spent on ECE increased in last 6 months	Continue engaging when schools reopen	Continue engaging when content stops
<b>Reference: Group I (attending balwadis, not participating in E-paathshala)</b>									
<b>Group II</b> (balwadis and E-paathshala program)	<b>0.93***</b> (0.3)	<b>0.39</b> (0.3)	<b>0.03</b> (0.1)	<b>0.02</b> (0.1)	<b>-0.05</b> (0.1)	<b>-0.02</b> (0.4)	<b>0.20***</b> (0.1)	<b>0.12***</b> (0.1)	<b>0.14**</b> (0.1)
<b>Group III</b> (Akanksha schools and E-paathshala program)	<b>0.35</b> (0.2)	<b>0.49**</b> (0.2)	<b>0.10**</b> (0.1)	<b>0.24***</b> (0.1)	<b>-0.12**</b> (0.1)	<b>-0.40</b> (0.4)	<b>0.23***</b> (0.1)	<b>0.37***</b> (0.1)	<b>0.33***</b> (0.1)
<b>Child's Age and Sex</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Household Size</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Mother's Education</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Log Monthly Income</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Social Category</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Devices and internet at home</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES
Lockdown period	YES	YES	YES	YES	YES	YES	YES	YES	YES
Summer Holidays	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>Constant</b>	<b>3.10***</b> (0.7)	<b>1.03</b> (0.8)	<b>0.42***</b> (0.2)	<b>-0.28*</b> (0.2)	<b>0.69***</b> (0.2)	<b>2.07***</b> (0.8)	<b>0.17</b> (0.2)	<b>0.15</b> (0.2)	<b>0.17</b> (0.2)
<b>R<sup>2</sup></b>	0.15	0.06	0.04	0.1	0.07	0.07	0.12	0.17	0.16
<b>N</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>

Note: Standard errors in parentheses (\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ ). Equivalence of Groups II and III are also tested and reported, where significant.

## APPENDIX

Table 4: Complete Regression Table

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	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	Engaged in "none" of activities in last week	Hours spent on ECE in last week	Time spent on ECE increased in last 6 months	Continue engaging when schools reopen	Continue engaging when content stops
<b>Reference: Group I (attending balwadis, not participating in E-paathshala)</b>									
<b>Group II</b> (balwadis and E-paathshala program)	<b>0.93***</b> (0.3)	<b>0.39</b> (0.3)	<b>0.03</b> (0.1)	<b>0.02</b> (0.1)	<b>-0.05</b> (0.1)	<b>-0.02</b> (0.4)	<b>0.20***</b> (0.1)	<b>0.12***</b> (0.1)	<b>0.14**</b> (0.1)
<b>Group III</b> (Akanksha schools and E-paathshala program)	<b>0.35</b> (0.2)	<b>0.49**</b> (0.2)	<b>0.10**</b> (0.1)	<b>0.24***</b> (0.1)	<b>-0.12**</b> (0.1)	<b>-0.40</b> (0.4)	<b>0.23***</b> (0.1)	<b>0.37***</b> (0.1)	<b>0.33***</b> (0.1)
<b>Child's Age</b>	-0.07 (0.1)	0.19 (0.1)	0.03 (0.0)	0.05** (0.0)	-0.05** (0.0)	-0.17 (0.1)	-0.03 (0.0)	-0.01 (0.0)	-0.00 (0.0)
<b>Child's Gender</b>	-0.10 (0.1)	-0.15 (0.2)	0.00 (0.0)	-0.01 (0.0)	0.04 (0.0)	-0.07 (0.2)	-0.08** (0.0)	0.03 (0.0)	-0.00 (0.0)
<b>Household Size</b>	0.01 (0.0)	0.02 (0.0)	0.00 (0.0)	-0.00 (0.0)	-0.00 (0.0)	-0.09** (0.1)	-0.00 (0.0)	-0.00 (0.0)	-0.01 (0.0)
<b>Mother's Education more than 10<sup>th</sup> grade</b>	0.10 (0.1)	0.02 (0.2)	0.01 (0.0)	0.02 (0.0)	0.00 (0.0)	-0.37** (0.2)	0.01 (0.0)	0.07* (0.0)	0.11*** (0.0)
<b>Log Monthly Income</b>	0.04 (0.0)	0.04 (0.0)	0.02 (0.0)	0.03*** (0.0)	-0.02** (0.0)	0.12*** (0.0)	0.01 (0.0)	0.02* (0.0)	0.00 (0.0)
<b>Occupation of household head (Driver)</b>									
Technical Labour	0.33 (0.3)	0.25 (0.4)	0.02 (0.1)	0.13 (0.1)	-0.09 (0.1)	-0.29 (0.4)	0.01 (0.1)	0.12 (0.1)	0.08 (0.1)
Self-Employed	0.63*** (0.2)	0.12 (0.3)	0.00 (0.1)	0.12* (0.1)	0.01 (0.1)	-0.35 (0.3)	0.02 (0.1)	0.07 (0.1)	0.05 (0.1)
Informal Labour	0.08 (0.2)	0.30 (0.0)	0.04 (0.0)	0.12** (0.1)	-0.04 (0.0)	-0.19 (0.3)	0.00 (0.0)	-0.01 (0.1)	0.02 (0.1)

Services	0.39**	0.23	0.05	0.00	0.00	-0.26	0.01	0.09	0.06
	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.3)	(0.1)	(0.1)	(0.1)
Unemployed	-0.27	-0.45	-0.02	0.03	0.08	-0.15	-0.07	0.05	-0.06
	(0.4)	(0.4)	(0.1)	(0.1)	(0.1)	(0.5)	(0.1)	(0.1)	(0.1)
<b>Older child attended pre-school</b>	-0.41**	-0.92***	-0.12***	-0.13***	0.07**	0.25	0.13***	-0.01	-0.02
	(0.2)	(0.2)	(0.0)	(0.0)	(0.0)	(0.2)	(0.0)	(0.0)	(0.0)
<b>Social Group: General (Hindu)</b>									
<b>SC/ST (Hindu)</b>	0.38*	0.61***	0.05	-0.08	0.04	0.86***	-0.24***	-0.06	-0.07
	(0.2)	(0.2)	(0.0)	(0.1)	(0.1)	(0.3)	(0.0)	(0.1)	(0.0)
<b>OBC (Hindu)</b>	0.04	0.32	-0.02	-0.09*	0.01	0.46	-0.15***	-0.08	-0.03
	(0.2)	(0.2)	(0.0)	(0.1)	(0.0)	(0.3)	(0.0)	(0.1)	(0.1)
<b>Muslim and Others</b>	0.25	0.54**	0.12***	-0.06	-0.12**	0.88***	-0.17***	-0.33***	-0.29***
	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.3)	(0.1)	(0.1)	(0.1)
<b>Have Computer</b>	0.07	-0.09	-0.02	0.10**	-0.02	0.07	0.09*	-0.05	-0.04
	(0.2)	(0.2)	(0.0)	(0.0)	(0.0)	(0.4)	(0.1)	(0.1)	(0.1)
<b>Have smartphone with internet</b>	0.02	0.16*	0.03*	0.03	-0.04**	0.32**	0.03	0.03	0.06***
	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.2)	(0.0)	(0.0)	(0.0)
<b>Have TV</b>	-0.14	-0.40**	-0.05	-0.02	0.08**	0.06	0.09**	-0.03	-0.00
	(0.2)	(0.2)	(0.0)	(0.0)	(0.0)	(0.2)	(0.0)	(0.1)	(0.1)
Lockdown period	1.06***	0.55**	0.02	0.11***	0.04	-0.18	0.06	0.10*	0.07
	(0.2)	(0.2)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	(0.1)
Summer Holidays	-0.26	-0.08	-0.08*	-0.14**	0.09	1.23***	-0.13**	-0.10	-0.10
	(0.2)	(0.3)	(0.0)	(0.1)	(0.1)	(0.4)	(0.1)	(0.1)	(0.1)
<b>Constant</b>	3.10***	1.03	0.42***	-0.28*	0.69***	2.07***	0.17	0.15	0.17
	(0.7)	(0.8)	(0.2)	(0.2)	(0.2)	(0.8)	(0.2)	(0.2)	(0.2)
<b>R<sup>2</sup></b>	0.15	0.06	0.04	0.1	0.07	0.07	0.12	0.17	0.16
<b>N</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>	<b>676</b>

Note: Standard errors in parentheses (\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ ). Equivalence of Groups II and III are also tested and reported, where significant.