Chapter 2
Research in India on Early Childhood Education and School Readiness: Some Learnings

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Abstract This chapter offers field-based and empirical insights into the content, processes, and implementation of ECCE in India, through a review of the research available within the country on ECE and School Readiness. The first part of the chapter focuses on research studies conducted in the past decade in India; these are thematically categorized. This part also discusses the implications of their findings. The second part provides a brief introduction to the methodology, findings, and recommendations of the recently concluded longitudinal India Early Childhood Education Impact Study (IECEI), which is the first large-scale study of its kind in the country; it has also influenced the content and structure of this volume.

Keywords Indian research · Early childhood education · ICDS · India Early Childhood Education Impact Study(IECEI)

The Research Context

Early Childhood Care and Education (ECCE) and its important role in the context of preparing children for school have been well acknowledged in India over the years in terms of both policy and, to an extent, provisions. As discussed in Chapter 1, the Integrated Child Development Services (ICDS) has been in existence in India since 1975 and is almost universalized now. This is perhaps the largest public-sponsored provision of services for children below 6 years of age in the world. The program includes preschool education as one of its six services. Private provisions for ECCE are also expanding at a significant pace across the country and are no longer limited to urban areas. In comparison, the NGO sector in ECCE is miniscule in terms of coverage, although it is of some significance with respect to alternative models. While provisioning in terms of ECCE services is significant, ECCE as a domain for research has been relatively less explored.

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Perhaps a major reason for this is the fact that India has only about 30 Home Science colleges that offer postgraduate programs in home science and child development, with ECCE as one of their many courses. Being an area of very low visibility among the academia, ECCE as an independent subject/discipline had till recently not been included in universities and other higher learning and research institutions. It is only in the last decade that a few universities such as Ambedkar University, Delhi; Jamia Milia Islamia; M S University Vadodara; and SNDT University, Mumbai, started offering postgraduate programs in this discipline and/or set up centers[1] for research in this area so that some interest in research in ECCE is emerging.[2] As compared to these initiatives, national institutions like the National Council of Educational Research and Training (NCERT) and the National Institute of Public Cooperation and Child Development (NIPCCD), which have the mandate to engage more directly with the states and the larger system in an advisory role, have in the past been able to undertake more significant research in this area.

A major deterrent to research is also the dearth of reliable data on ECCE in the country, as ECCE is a largely unregulated sector. Research initiatives on ECE or school readiness in India have therefore been largely focused on the public-sponsored ICDS program, which, as mentioned earlier, is almost universalized across India with 1.3 million centers on the ground. Studies range from an assessment of the impact of participation in ICDS' preschool education component to assessing the impact of interventions, and/or reviews of diverse process related ECE characteristics such as curriculum, multilingualism, early literacy, community participation, and mentoring support.

Given India's scale and diversity, representativeness of the sample is a major methodological challenge for research. Since many of the existing studies are limited to one or a few states with samples that may, in their own right, be large and representative for the state but may not necessarily stand the test of representativeness for the size and diversity of the country, the findings do not lend themselves to generalizations. However, they do provide glimpses of the program's functioning and often generate insights into possible associations and interrelationships in the given domain that have the potential to impact, thus providing some direction for further research and making improvements in program implementation.

Some Insights from Research

I now discuss some of the learnings from larger research and evaluation studies in the context of specific thematic areas that have emerged from the review.

[1] See website for CECED and CECDR in References.

[2] The National Policy on ECCE (2013) specifies 3 to 6 years as the age for preschool education and the Right of Children to Free and Compulsory Education Act (RTE, 2009) indicates age 6 as eligibility for entry to grade 1.

Is ICDS Delivering Good Quality ECE/Preschool Education?

ICDS has been in operation since 1975 though it was scaled up only after the 8th Five Year Plan. Hence, its ECE component has been studied more systematically only in the last two decades. A survey by NCERT which had representation from all four regions of the country found that a large number of children came to school with no preschool experience despite the availability of ICDS. These children demonstrated deficiencies in concepts and skills related to readiness for reading, writing, and mathematics (NCERT, 1998). The National Institute of Public Cooperation and Child Development (NIPCCD) published a compilation of 68 studies conducted between 1996 and 2008, each of which evaluated ICDS from multiple perspectives (NIPCCD, 2009). These covered almost all the Indian states. Given ICDS' multisectoral design, the studies covered different services of the program, and some also included ECE or preschool education as it is referred to in the ICDS context. The latter studies, which are largely in survey mode, provide some insights into issues of access, equity, and quality in ECE.

The overview from these studies indicates that allowing for state differences, "pre-school education has been in great demand, especially in areas where parents were relatively well educated. However, the development needs of young children are poorly understood by communities, and therefore the community monitoring of preschool education is limited. This has led to some casualness about pre-school education in many Anganwadi Centers (AWCs). Lack of space, infrastructure and basic facilities were common hurdles, and many Anganwadi workers (AWWs) were inadequately trained for this purpose" (NIPCCD, 2009, p. 97).

One of these studies conducted in Odisha, with a sample of 455 children across rural, urban, and tribal belts, focused in particular on the preschool curriculum and reported it to be largely focused on rote counting. Interestingly, and almost counter-intuitively, when asked to count up to 5, the tribal children performed better as compared to the other two categories. In Karnataka, a large number of respondents mentioned that "pre-school was the weakest link in the ICDS programme, because the AWWs spent a lot of time on added responsibilities outside the core ICDS programme. This left them with insufficient time to concentrate on pre-school activities. Another reason was the presence of Kannada or English medium private schools which motivated some parents to send their children to these schools. This was because the kindergarten programme of these schools laid emphasis on reading and writing, whereas the pre-school of ICDS limited itself to oral knowledge" (IIM, Bangalore 2005 p. 126)

Similar evidence was reported in Rajasthan and other states as well, reflecting a lack of awareness among parents of what is good quality ECE, as also the lacunae in the ICDS preschool services run solely by a single, poorly trained, multipurpose worker with support from a helper. In this context, a World Bank study in Tamil Nadu included in the compilation found that the state's initiative to make two workers available in almost 90% of the centers, one to take care of the 0- to 3-year-olds and the other to take care of preschool education of the 3- to 6-year-olds,

improved the quality of the preschool education provided. This finding provides clear support to a recommendation made recurrently in various fora for a second worker in each center who could be trained and given responsibility for conducting ECE for 3- to 6-year-olds. This recommendation has been ignored possibly due to financial constraints; as a result, the existing situation with regard to ECE continues to remain the same; this is also evident in later research.

An evaluation of ICDS, sponsored by the erstwhile Planning Commission in 2011 which covered 300 ICDS projects[3] spread over 100 districts in 35 states and UTs, reported that, on average, most of an AWW's time was spent on record keeping followed by preschool education and then on feeding activity. In terms of the quality of the curriculum, on average, activities which did not require materials or space such as stories, counting, and free conversations were observed in most centers, while those like drawing, puzzles, and material-based activities were less popular and available in only around 50% of the AWCs. However, there were significant state differences. The evaluation also confirmed that maximum participation in preschool education in ICDS was from the underprivileged and backward classes. It also raised the issue of gender with more girls than boys participating in ICDS and more boys attending private schools. In a study conducted in 2012–2015 in 12 districts of Gujarat, Chudasama et al. (2014) also raised issues of low coverage and quality of preschool education. They identified gaps in terms of infrastructure facilities; quality of the training; coverage, supply, and provision of supplementary nutrition; status of ECE activities in AWCs; and provision of other services to the beneficiaries. A baseline study in Medak district of Andhra Pradesh documented serious limitations in an ICDS tribal project such as poor infrastructure and lack of space; low academic qualifications of the AWWs; inadequate training for just 4 days; worker absence; and irregular attendance by children who were largely from illiterate and poorer families that hampered effective implementation of ECE (APF, 2013). A comprehensive multisectoral perspective emerged from a study by the World Bank in 2004 which examined major schemes for children in the public domain and identified several gaps in implementation, including wastage due to duplication of resources. It made a strong recommendation for strengthening institutional capacity and decentralization in planning and implementation in a convergent mode at the village level, leading to a very successful demonstration project in Madhya Pradesh "Bachpan." The study also presented an Indian conceptual framework for children's holistic development (World Bank, 2004).

Does Participation in ECE/Preschool Education Matter?

The most comprehensive study on ECCE in India which examined the status and impact of preschool education on children's school readiness and subsequent learning levels is the recent longitudinal mixed methods India Early Childhood

[3] Each ICDS project has 100 centers.

Education Impact Study (IECEI, 2011–2017) which has also informed the conceptual framework for the design and structure of this volume. Given its integral relationship with this publication, this study and its findings are separately summarized in greater detail later in this section.

NCERT conducted a national level study to assess the impact of participation in ECE on dropout rates in primary grades across eight Indian states. Using a quasi-experimental design, the study retrospectively backtracked 38,000 children in Grade 5 across eight Indian states to compare dropout rates between preschool participants and nonparticipants. The results indicated a significant gain of 8–20% in retention rates among the former, which it attributed to age-appropriate participation in ECE (Kaul et al., 1994)**.** Anecdotal evidence from teachers suggests that these benefits extend to the psychosocial domain as well since children with preschool experience are observed to be more confident and participate more actively in school activities as compared to those who come directly to school.

Experiences and Effects of Curricular Interventions in Preschools

Dhingra and Sharma (2011) compared 200 children enrolled in anganwadis and 200 homebound children in Jammu district on six cognitive skills—conceptual information, comprehension, visual perceptions, memory, and object vocabulary. Their study showed significant gains associated with anganwadi participation and identified age and gender as significant factors with girls and older children performing better. In a longitudinal research in a tribal multilingual context, Gupta and Samant (2017) reported that 5-year-old children were able to perform prenumber concept tasks but struggled with sequential thinking. They attributed this to lack of exposure to these concepts and skills in their curriculum. A few smaller-scale studies conducted in different states also explored and reported positive effects of participation in preschool education in ICDS, as compared to a control group of nonparticipants (Dhingra and Sharma, 2011; Raizada, Sachar, Bhatia, Sehgal, & Soni, 1993). Singh (2013), however, reported a negligible impact of preschool participation in his study and raised issues regarding the quality of preschool education in ICDS.

A longitudinal micro-study on the impact of a year-long concept based intervention focused on the mathematical readiness curriculum for 4- to 5-year-olds in an urban preschool. It tracked learning outcomes into primary grades and reported a significant impact of the intervention especially in the case of higher-order skills (Kaul & Dadhich (1995). A more recent unpublished impact evaluation of an NGO initiative in ECE covering anganwadi centers across Bengaluru in Karnataka indicated benefits of providing open-ended play materials like building blocks and other toys and time and space in the curriculum for free play in facilitating concept formation (CECED, 2013). In the context of a curricular reform intervention, Meenai, Sen, and Firdos (2015) identified support of facilitating middle- and

senior-level officials as a key factor in the effective implementation of preschool education from a systemic perspective in ICDS anganwadis in Haryana.

A national survey of preservice teacher education institutions in different regions in the country explored the extent of professionalism in preparing ECE teachers in India. The findings indicate significant issues in teacher preparation with inequitable distribution of teacher education programs/institutions in the country; inadequate regulation of quality and certification; and lack of demand for professional preparation due to absence of any regulatory requirement for appointing professionally trained teachers in ECCE, primarily since there is minimal government presence in this domain of school education (CECED, 2011).

Challenges in Research in Tribal Multilingual Contexts

A recent longitudinal study by ICF to assess the impact of mother tongue-based education on tribal children in Odisha documents the challenges faced in conducting research in tribal areas. The challenges include lack of availability of culturally relevant and standardized early childhood education tools in India; translation of tools into tribal languages that do not have a written script; and identifying, recruiting, and training data collectors with appropriate cultural understanding, familiarity with tribal language, and educational skills who are also willing to work in remote and insurgent areas of the state (Gupta, 2016). In the context of the same study, Rajesh and Samant (2017) mention the critical importance of engagement with the local community and a committed community-based teacher who understands the local language and can, with training and coaching, be able to create a joyful learning environment for the local children.

In her documentation of the classroom processes in a trilingual environment with English, Hindi, and Urdu languages in preprimary and Grade 1 in an urban school, Sen (2017) laments the lack of attention to children's sociocultural context while using pedagogic practices that are teacher directed and records how "these do not privilege the centrality of the learner in the learning process" (p. 122). She observed no difference in the teaching methodology for all the languages irrespective of varying levels of children's familiarity with each.

While these research studies are solely in the context of the underprivileged, two small-scale unpublished studies conducted by postgraduate students as part of their course requirement provide an interesting but very different urban, middle class perspective. Both studies interviewed parents, while one also observed a preschool. The latter reports English competency to be a top priority for parents as expressed by them for their children's academic and professional success, while they believed that the mother tongue could be learnt informally. In the two preschools observed by the student there was very little evidence of the use of home language or multilingualism as a resource (Dutt, 2018). This language disconnect is a major issue in the higher end private preschools in India. A recent reading survey of elementary grades from a sample of private schools in this category across India

indicates good skills of decoding but poor reading comprehension, which is perhaps symptomatic of this issue (Stones & Milestones, 2018).

Another study by a student focusing on the learning environment at home found that mothers reported telling stories and singing songs with children but also believed that this practice was slowly getting replaced by children's commercial programs on television and You Tube programs on smart phones. She found that children's homes had Chinese manufactured toys but there were no books other than school books. The impact of technology was clearly evident (Gurung, 2018).

On the basis of a recent review of the findings of the multicountry Young Lives study which includes a sample from Andhra Pradesh in India, Woodhead's (2009, p. 19) remarks provide a relevant conclusion to this section:

> current arrangements for early childhood care and education appear in many cases to run counter to the requirements for implementing the rights of every child, and are equally incompatible with achieving social equity. While some government services in the countries studied are explicitly intended to be pro-poor, all too often they do not function effectively to achieve that goal in practice. At the same time, the impact of a growing private sector is to reinforce rather than reduce inequities of access to quality education. In order to reverse these trends, governments along with international donors and other agencies have a central role to play.

The India Early Childhood Education Impact (IECEI) Study: A Summary

The IECEI study (Kaul et al., 2017) is the first large-scale study on early learning in India and perhaps also in South Asia that was designed as a longitudinal, mixed-methods study to examine trends in young children's participation in preschool at the age of 4 years and beyond till the age of eight years; the quality of the institutions that they attended; and the short- and medium-term outcomes of this participation. It explored the relationship between quality and quantity of children's participation in preschool on the one hand and their school readiness at 5–6 years—the age for school entry in most Indian states—on the other. The study also examined the association between children's school readiness levels at age 5 with their performance in early grades in primary schools. School readiness was conceptualized in terms of cognitive (including language) and personal social skills and behavior associated with academic performance and social adjustment.

Research Questions

Specifically, the IECEI study aimed to answer the following questions:

- What institutions do children participate in between the ages of 4 and 8, and how do these patterns vary over time and across locations?

- What is the impact of these participation trajectories on children's school readiness at age 5?
- Does greater school readiness at age 5 improve children's learning outcomes at age 6, 7, and 8?
- Is the relationship between preschool participation and subsequent learning outcomes similar for all children, or do the outcomes vary depending on children's personal and household characteristics?
- Are there specific dimensions or characteristics of preschools that improve children's readiness for school which can therefore be identified as components of "good quality" early childhood education in the Indian context?

Methodology

The IECEI study was implemented over a period of five years (2011–2016). It was implemented exclusively in the rural sector across three Indian states: Telangana (erstwhile Andhra Pradesh), Assam, and Rajasthan (Fig. 2.1), selected to represent different regions of the country. Within each state, two districts were selected, of which one was purposively selected because it housed a "known practice" ECE program (one that was regarded as being "innovative" by many experts) to ensure adequate variations in quality, so as to be able to examine the association between quality characteristics and outcomes.

The IECEI study was designed with the objectives of generating: (a) district level estimates of children's participation and outcome indicators, requiring a survey method with a larger, randomly selected sample and quantitative indicators; and (b) a more detailed, observation-based understanding of the characteristics of preschool programs and their impact on children through a quasi-experimental method, requiring smaller samples, greater technical expertise, longer periods of data collection, and more varied data collection instruments. A third strand used qualitative methods to elicit a more in-depth and nuanced understanding of quality dimensions in preschools through analytical case studies of nine good practices and subsequently of an entire village to understand the phenomenon of privatization in rural India. Thus, the study was designed as three separate strands, each with measures and methods appropriate to its objectives, linked by a common village sampling procedure and a common set of core indicators. An overview of each strand's objectives, sample, and methods is provided in an annexure to this chapter (Table 2.1).

Strands A and B tracked preschool participation trends among the respective sampled cohorts on a quarterly basis over the study period and assessed their school readiness outcomes (at ages 4 and 5) and cognitive learning outcomes (at ages 6, 7, and 8) on an annual basis. In addition, both strands collected data on household characteristics of the sampled cohort of children to assess the contribution of these factors to a child's school readiness and later learning. In addition, Strand B also conducted detailed classroom observations every year for ECE's quality assessment

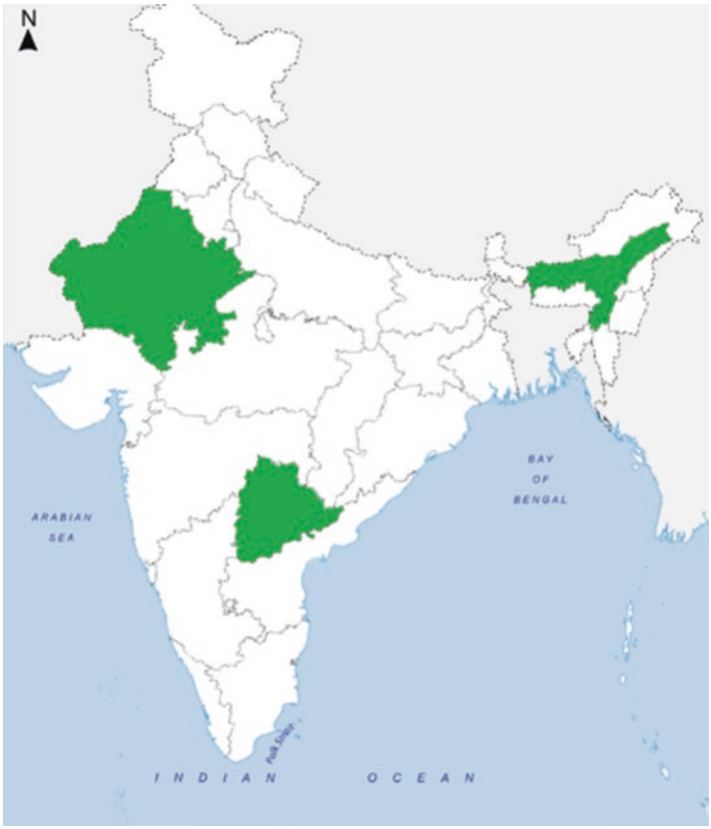

Fig. 2.1 Three Indian states covered in the IECEI study

and that of early grade programs attended by the cohort of children being tracked, to analyze the quality of the institutions at the preschool and primary stages and their impact on children's school readiness and subsequent learning in school. The instrument employed in the study for each variable was developed /adapted for the requirements of the study through a rigorous process of trialling and validation. Finally, under Strand C, the research also incorporated methods and measures to study parental choices with respect to their children's preschool participation in a subset of households and, more comprehensively, through a village case study and a more in-depth analysis of the systemic factors promoting quality from nine case studies of good practices. The results from the three strands were triangulated for the final analysis and for identifying the research findings and recommendations (Kaul et al., 2017).

Major Findings

Some key findings of the IECEI study are:

A. Status of Early Childhood Education in India

(i) Near universal access: Every one of the 350+ villages sampled for the study across the three states was found to have at least one ICDS anganwadi and over half of all the villages also had at least one privately managed preschool. With respect to children's participation, over 80% of the sampled children across the three states were already attending some form of early childhood education center at age 4, whether government-run anganwadis or privately managed preschools. There were, however, state differences in both provisioning and participation levels.

(ii) Multiple Pathways: Tracking of the cohort over 4 years revealed that participation trends in early grades from age 3 to 8 were nonlinear with children following multiple pathways. In contradiction of the Right To Education Act all the three states covered had 5+ and not 6 years as the official entry age for Grade 1, so that most 5-year-olds were found already in school and not in preschool. But some 4-year-olds were also in primary school and some 7-8-year-olds were still in preschool. Children thus did not follow clear age-wise trajectories as the policy expects. Despite the no-detention policy, children's progression was not necessarily linear. There was significant lateral movement including cases of repetition, especially across private preschools and schools. Thus, it was only by age 8 that over 90% of the sampled children in all the three states were in primary school and the enrolment stabilized. The common assumption that children across the country follow a linear trajectory and enter the same grade at the same age, does not therefore match with ground realities.

(iii) Formal Teaching: Curriculum and pedagogical processes tend to focus on formal teaching of academic skills and are not in most cases developmentally appropriate. Both anganwadis, and more particularly, private preschools, the two main options available to a majority of the children, were not observed to be offering an age and developmentally appropriate play-based curriculum as per policy. Formal teaching of reading, writing, and arithmetic was observed to be the most prevailing practice across preschools in terms of the time on task analysis. This was found to have an inverse relationship with developmentally appropriate practices. Play, storytelling, and free play in activity corners and other early childhood activities were conspicuous by their absence. There were significant state differences.

(iv) School Readiness levels: Overall, the children's school readiness scores at age 5 were very low. Children's school readiness levels in cognitive and language domains were found to be very low at the time of school entry, that is, at age 5+. This is a matter of concern. Poor outcomes were more

marked for certain cognitive competencies such as sequential thinking, pattern making, classification, one to one correspondence, relative comparisons of numbers, and phonemic differentiation. Given that this was the status despite the fact that the sampled children had participated in preschool programs may be attributable to the poor quality of the programs that they attended.

B. Impact of School Readiness: Some Significant Associations

(i) While overall school readiness levels were found to be low, even one year of participation in a preschool setting from age 4 to 5 was found to have a significant association with children's school readiness levels. However, over time, the effect size, though still significant, decreased.

(ii) Preschool participation effects were much larger and had more significant and sustained association with school readiness levels at age 5+ and with learning levels in primary grades when the quality of the programs attended was observed to be better and more developmentally appropriate as per the scores obtained from classroom observations on the quality tool.

(iii) Other factors influencing school readiness levels were the age of the child,[4] mother's education, household assets, and learning environment/print availability at home.

(iv) A longitudinal analysis indicated that school readiness levels (on preliteracy and pre- math competencies) at age 5+ had a significant linear association with mathematics and language scores through the primary grades, thus "validating" the significance of "school readiness" as a construct as conceptualized and measured in the study, for later levels of learning. This finding may also help explain children's persistently poor learning outcomes in primary grades.

(v) A longitudinal analysis also indicated that most children had not acquired these competencies at the time of entry to school and were able to master many of these only by age 7 or 8, despite having attended a preprimary program. There is, however, some indication from a similar analysis with data from an innovative preschool program on a very small sample that mastery of these competencies can be accelerated and children enabled to have a sound foundation, if they are exposed to a good quality, play-based, and developmentally appropriate preschool curriculum between ages 4 and 5. Such exposure was also found to reduce equity gaps in learning outcomes between children from more disadvantaged and less disadvantaged households. This needs further research and validation by a larger sample.

[4] The National Policy on ECCE (2013) specifies 3–6 years as the age for preschool education, and the Right of Children to Free and Compulsory Education Act (RTE, 2009) indicates age 6 as eligibility for entry to Grade 1.

(vi) The key quality factors that emerged as significant for children's readiness related to attributes of the teacher, the curriculum, and the physical setting. In particular, high quality ECE programs have teachers who understand the age, developmental and contextual appropriateness of the curriculum; who are sensitive to children's needs and not only interact regularly with the children but also encourage interaction among them; and an ECE curriculum that focuses on concept formation and cognitive skills, rather than formal teaching.

(vii) The study confirms a significant association between school readiness and learning levels in primary grades. It also confirms the key contribution of a developmentally appropriate preschool curriculum in enhancing school readiness levels with sustained impact on performance in the primary grades. Age emerged as a significant factor influencing school readiness with some higher-order cognitive skills and competencies not evident in children till the age of 7–8 years. At the same time, the study also identifies a nonlinear trend in participation in early years all the way up to 8 years resulting in a high probability of multiage class compositions in every grade. Given this fluid and dynamic state, the study makes a strong recommendation for a *foundational curriculum* which allows for upward curricular continuity and individually paced, flexible learning from preschool to primary grades. Some of its other recommendations include setting up measures for regulation; strengthening teacher development; and mentoring and advocating for 6 rather than 5 years of age as more appropriate for entry to Grade 1.

Conclusion

The research reviewed in this chapter reflects at best a glass half full. While a large number of children are getting the benefits of access to ECE through ICDS (universalization of which in the public domain is no mean achievement of the government) and through the expanding private sector, issues of inadequate equity, quality, and institutional capacity still remain to be addressed. There is no doubt that "the continued success of the ICDS will be determined by how well it evolves to address current weaknesses, adheres to evolving quality standards, and prepares children for life in school and beyond" (Rao & Kaul, 2017, p. 31).

The fact that there are significant state differences indicates the need for moving away from one shoe fits all strategies to addressing these issues more comprehensively and contextually, since it is evidently not only the characteristics of the community or the program that influence what children need and ultimately receive but also the larger political economy and governance structures and processes within which these are situated, that are important. To conclude, nothing short of a system approach and coordinated planning and implementation can successfully serve the needs of India's children. To end with a quote from a popular African proverb "it takes a village to raise a child."

Annexure

Table 2.1 Research design of the IECEI study

RESEARCH DESIGN: MIXED METHODS, 3 STRANDS			
Strand	Methodology	Objectives	Sample
A	Survey method	To derive district level estimates of (a) Children's preschool and school participation from Age 4 to Age 8 (b) Children's school readiness levels at Age 4 and Age 5 (c) Children's early grade learning outcomes Age 6, 7 and 8.	306 villages 1591 preschool centres 11225 children
B	Quasi-experimental	(a) To study quality variations among ECE provisions across public, private & voluntary sector (b) To identify program elements that demonstrate significant impact on children's school readiness and subsequent early grade outcomes	75 villages 298 preschool centres 2779 children
C	Qualitative Case Study	(a) To conduct In-depth case studies of preschool programs considered to be examples of 'good practice' (b) To provide a more nuanced assessment of quality in terms of content, process, facilities	9 case studies, across states

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