Shaping Future Success: Evidence from an Early Childhood Human Capital Formation Intervention

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Abstract

Nearly 200 million children under five in low- and middle-income countries face developmental deficits, even as access to early childhood services expands. We present evidence from a large-scale randomized controlled trial (N=3,131 children in 201 schools) in Nepal's government system that targeted both classroom instruction and home learning environments. The intervention increased children's developmental outcomes by 0.10–0.20 standard deviations (ASQ scores) and improved caregiver engagement by similar magnitudes (Practice of Early Stimulation and Learning Index). Effects were most consistent when teachers received support that enabled them to sustain classroom quality while engaging families, underscoring the critical role of workload management in program effectiveness. Impacts were concentrated among disadvantaged households—those with lower baseline engagement, higher stress, and less education—highlighting the potential to reduce early childhood inequalities. Mechanism analysis shows that the intervention transformed home and school inputs from substitutes to complements, creating mutually reinforcing pathways for child development. These findings demonstrate that modest, system-embedded reforms can generate scalable improvements in early childhood human capital formation.

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1 Introduction

Children's earliest years are widely recognized as foundational for later life outcomes, with early interactions in the home and preschool shaping cognitive, socio-emotional, and physical development (Phillips and Shonkoff, 2000). Yet millions of children in low- and middle-income countries (LMICs) enter school without these foundations, limiting their ability to benefit from subsequent education and economic opportunities. Global estimates suggest that nearly 250 million children under age five in LMICs are at risk of not reaching their developmental potential due to poverty, malnutrition, or inadequate learning environments (Black et al., 2016). These early deficits have lasting consequences, including lower academic achievement (Dean and Jayachandran, 2020), reduced lifetime earnings (Heckman and Karapakula, 2019), poorer health (Campbell et al., 2014), and greater involvement in crime (Brutti and Montolio, 2021). A large body of research highlights the central role of parents and teachers as primary caregivers: responsive parenting and enriched early learning environments together provide the foundation for healthy development (Jeong et al., 2021).

As preschool enrollment has grown in many LMICs, policy conversations have shifted from getting children into programs to improving the quality of what they actually experience once enrolled (Masino and Niño-Zarazúa, 2016). Still, fewer than one in three children aged three or four attend a formal program, and provision remains highly uneven. Standards imported from high-income settings often fit poorly in LMIC contexts, where class sizes are large, resources are scarce, and cultural practices around early learning differ substantially (Alan, 2025; Chen and Wolf, 2021). Expanding services without a parallel focus on quality risks repeating the disappointing trajectory of universal primary education, when rapid gains in access were not matched by improvements in learning (Pritchett, 2013). Governments are nevertheless investing heavily, encouraged by evidence of the long-term value of early childhood education for human capital (Jakiela et al., 2024; McCoy et al., 2017). The challenge is to ensure that these investments translate into meaningful gains for children.

Cross-country evidence highlights both the promise and limits of existing approaches. A meta-analysis of pre-primary programs in 19 countries reports average gains of about 0.15 standard deviations (SD) in cognitive skills and 0.12 SD in socio-emotional skills, with effects persisting into later schooling and cost–benefit ratios ranging from 1.7 to 14.2 in LMICs (Holla et al., 2021). Yet participation remains below 20 percent in low-income countries, and pre-primary receives less than 2 percent of education budgets. Rigorous evidence on how to improve the quality of services at scale remains scarce. Most interventions to date have focused on parents—closing information gaps and promoting

stimulation practices (Attanasio et al., 2020; Gertler et al., 2014; Walker et al., 2011)[1]—while far less attention has gone to teachers and classrooms, or to how these two inputs interact. Recent studies underscore this point. In India, adding a half-time worker to preschools doubled instructional time and improved both learning and nutrition outcomes at scale (Ganimian et al., 2024). In Colombia, however, providing preschools with teaching assistants alone had no effect because teachers reduced their effort, while combining assistants with teacher professional development improved children's cognitive outcomes, especially among the most disadvantaged (Andrew et al., 2024). Together, these findings suggest that what matters is not simply the level of resources but how responsibilities are structured and how teachers and parents are supported to use them effectively.

This paper evaluates an early childhood intervention in Nepal that addresses information gaps for both parents and teachers while explicitly testing how supply-side constraints shape program effectiveness. We build on the widely used "train-the-trainer" model, in which teachers receive structured training in child development and then deliver parental education sessions, but introduce two additional treatment arms to assess how teacher workload and staffing support influence outcomes. Teacher workload is a central constraint in LMICs: teachers are typically responsible not only for classroom instruction, but also for administrative duties, home visits, and community engagement, often with little external support (Glewwe and Kremer, 2006). Evidence suggests that overburdened teachers struggle to maintain instructional quality while taking on additional responsibilities, leading to weak implementation and low adoption of new practices. In such contexts, interventions that increase responsibilities without easing existing burdens risk compromising both classroom quality and parental engagement.

We randomly assigned 201 schools in the Jhapa district of Nepal across four groups. Treatment Arm 1 (T1: Teacher Training) included 50 schools where teachers completed a 15-day professional development program. The first ten days focused on pedagogy, classroom practices, and national standards for early childhood education, while the final five days prepared teachers to lead parental education sessions. Following training, each teacher delivered 20 two-hour sessions over six months to primary caregivers, covering health and nutrition, hygiene, disability awareness, and strategies for cognitive and socio-emotional stimulation through play and storytelling. Treatment Arm 2 (T2: Teacher Training + Inside Classroom Helper) included 50 schools and provided the same training, but each teacher was supported by a classroom helper hired on a seven-month contract to assist with daily classroom management and routine tasks, easing workload and enabling teachers to sustain

[1]See also related evidence in Bos et al. (2024); Lopez Garcia et al. (2021); Macmillan and Tominey (2022).

instructional quality while conducting caregiver sessions. Finally, in Treatment Arm 3 (T3: Teacher Training + Outside Classroom Facilitator) followed the same training model, but parental sessions were delivered by an external facilitator trained on the same curriculum. Teachers in T3 focused exclusively on classroom instruction, while facilitators assumed responsibility for engaging parents. The remaining 51 schools served as a control group and continued business as usual. This design permits a clean comparison of three models of delivery: teachers managing both classroom instruction and parent sessions (T1), teachers supported by in-class staff (T2), and teachers focusing only on instruction while parental engagement is handled externally (T3).

The three treatment arms address a central question in early childhood education: how responsibilities between teachers and support staff should be organized when both classroom instruction and parental engagement are essential for child development. T1 preserves the teacher's central role in both domains but risks overburdening them in resource-constrained settings. T2 tests whether relieving workload inside the classroom allows teachers to maintain quality and strengthen links between school and home. T3 introduces a division of labor in which facilitators manage parents, raising the question of whether specialization improves efficiency or instead weakens complementarities between classroom instruction and parental engagement. The comparison across arms therefore provides direct evidence on whether workload relief and task specialization improve effectiveness, or whether keeping teachers at the center of both domains yields stronger outcomes despite the additional burden.

Our findings show consistent improvements in classroom environments, teaching practices, and developmental outcomes, though the pattern varied by treatment arm. In T1, we find the largest improvements in children's development, with ASQ scores rising by 0.20 standard deviations (SD). Teachers in this group also fostered modest but positive changes in caregiver engagement (0.11 SD), and classrooms experienced substantial gains in quality. Teacher–child interactions improved markedly, with positive behaviors increasing and negative interactions declining, suggesting that professional development alone was sufficient to shift pedagogical practices when teachers remained fully responsible for both classroom and parental engagement. In T2, impacts were more balanced across domains. Classroom quality improved by 1.14 SD—the largest effect across arms—while children's developmental outcomes rose by 0.15 SD. Caregiver engagement also increased significantly (0.16 SD), the highest improvement observed across all treatment arms. This arm also generated the strongest improvements in caregiver attitudes toward disability, underscoring the value of in-class support for strengthening parent-facing components of the intervention. The classroom helper appears to have enabled teachers

to maintain high-quality instruction while simultaneously deepening their engagement with families.

By contrast, T3 delivered more limited effects. Classroom quality improved modestly (0.60 SD), and parental engagement rose slightly (0.11 SD), but there was no detectable impact on children's development. Caregivers in this arm reported marginally lower stress, likely because facilitators assumed primary responsibility for outreach and session delivery. However, the separation of classroom instruction from parental engagement appears to have weakened the complementarities between home and school environments. The external facilitator model, while reducing teacher burden, may have created a disconnect between what children experienced in the classroom and the support they received at home. Taken together, the three arms reveal that interventions which relieve teacher workload while keeping teachers central to both instruction and parental engagement—such as the Training + Helper model—produce the most balanced and sustained improvements.

We further examine heterogeneity in program impacts by baseline parental engagement, caregiver stress, and caregiver education, and then explore the mechanisms through which these differences may have arisen. Impacts were most pronounced among families with initially low engagement, who showed larger reductions in caregiver stress and greater improvements in child development outcomes, while households with higher engagement and more educated caregivers experienced smaller incremental gains. Consistent with this compensatory pattern, ASQ gains were concentrated among children with the lowest baseline scores, whereas improvements in parental engagement (PESL) were strongest among those with higher initial levels, indicating that the program operated through different channels depending on baseline family characteristics. Turning to exploratory mechanisms, one channel was parental participation: schools with classroom helpers recorded higher attendance at parent education sessions, suggesting that by easing teachers' classroom workload, helpers enabled teachers to devote more effort to mobilizing families, whereas facilitators did not provide the same advantage. Once parents began attending, however, regularity of participation was broadly similar across schools, pointing to recruitment rather than retention as the critical margin. A second mechanism involved the interaction between home and school environments. In control schools, parental engagement and classroom quality appeared to act as substitutes, but in treated schools the strongest gains in child development were observed when both were strong, suggesting that the intervention transformed these inputs from substitutes into complements. Overall, the evidence indicates that program impacts were larger among families with fewer resources at baseline, with gains shaped not only by who participated but also by how improvements in home and school environments reinforced one another.

We also benchmark our effect sizes against those reported for other early childhood programs in the literature to assess cost-effectiveness. In our study, the intervention improved scores by 0.13–0.20 SD on the Ages and Stages Questionnaire (ASQ) and 0.11–0.20 SD on the Practices of Early Stimulation and Learning (PESL). These gains are very close to pooled estimates from low- and middle-income countries, which report average improvements of about +0.15 SD in cognitive and +0.12 SD in socio-emotional development (Holla et al., 2021). Our results are comparable to Colombia's teacher professional development program, which improved child outcomes by +0.16 SD overall and +0.30 SD among the poorest households (Andrew et al., 2024), Rwanda's First Steps parenting program, which achieved gains of +0.30–0.38 SD (Justino et al., 2023), and India's urban home-visiting model, which raised Bayley-III scores by +0.30 SD (Andrew et al., 2020).[2] By contrast, our estimates are smaller compared to those from more resource-intensive programs—India's kindergarten subsidy produced +0.80 SD gains by kindergarten completion (Dean and Jayachandran, 2020), and Tamil Nadu's Integrated Child Development Services program improved language and mathematics scores by 0.29–0.46 SD (Ganimian et al., 2024). At the same time, they are clearly larger than the near-zero impacts of The Gambia's preschool expansion (Blimpo et al., 2022) and the modest +0.13 SD from Honduras' cash transfer program (López Bóo and Creamer, 2018). Taken together, estimates from this intervention fall in the middle of the distribution: stronger than transfer or access-only models, weaker than intensive center-based or scholarship programs, and most closely aligned with scalable, cost-conscious approaches that combine teacher training with structured parental engagement.

We make four contributions to the literature on early childhood development and human capital formation. First, we extend research on parenting interventions in LMICs, which has consistently shown that closing information gaps can improve early stimulation and caregiver practices (Gertler et al., 2014; Walker et al., 2011; Attanasio et al., 2020). Yet much of this literature also highlights the difficulty of sustaining such models at scale, given the heavy reliance on community health workers or paraprofessionals who themselves face severe capacity constraints (Lopez Garcia et al., 2021; Macmillan and Tominey, 2022). Our study speaks directly to this challenge by embedding parental education within schools and placing teachers at the center of delivery. By jointly targeting both caregivers and teachers, we move beyond the usual dichotomy of "school-based" versus "home-based" interventions and demonstrate how teacher-led parental education can generate complementary gains in both domains. This approach not only strengthens the home environment but also reinforces teacher–parent

[2]The Bayley Scales of Infant and Toddler Development, Third Edition (Bayley-III), is a standardized assessment widely used in early childhood research to measure cognitive, language, motor, social-emotional, and adaptive development in children aged 1–42 months (Bayley, 2006).

linkages, an aspect often missing in stand-alone parenting programs

Second, we contribute to the growing body of evidence on teacher professional development in early childhood settings. A large literature emphasizes the centrality of teacher–child interactions for children's learning and socio-emotional growth, yet most evidence in LMICs has come from small-scale pilots or descriptive studies. Work from Ecuador and Ghana has shown that variation in teacher quality and structured training programs can produce substantial effects on child development (Araujo et al., 2016; Wolf et al., 2019). Our results add new evidence from a large-scale government program, showing that even relatively modest training can shift teacher–child interactions in meaningful ways. We document reductions in negative practices such as punitive discipline, alongside increases in warmth, attentiveness, and active engagement. These findings echo meta-analysis work on teacher coaching (Kraft et al., 2018) but provide rare experimental evidence from a low-resource context, showing that professional development integrated into public systems can substantially improve classroom dynamics without requiring intensive or costly inputs.

Third, we build on a newer strand of the literature that focuses on the role of supply-side staffing constraints in shaping program impacts. Recent evidence from India's Integrated Child Development Services shows that adding a half-time worker increased instructional time and improved children's math and language outcomes (Ganimian et al., 2024), while studies from Africa find that teaching assistants can reallocate teacher time toward more productive activities (Duflo et al., 2015; Bold et al., 2018). We extend this evidence base by testing two alternative staffing models—helpers placed inside the classroom and facilitators placed outside the classroom—paired with an identical package of teacher training. This variation allows us to distinguish whether additional staff strengthen programs by reducing teacher workload or whether they inadvertently dilute the complementarities between classroom instruction and parental engagement. Our results show that only in-class support generated consistent improvements across classrooms, children, and caregivers, emphasizing that effective workload relief must complement rather than substitute for teacher effort.

Finally, we situate our findings within the broader policy debate on how to expand early childhood services at scale without sacrificing quality. Evidence from The Gambia demonstrates that expanding low-quality community preschools yielded no overall gains and in some cases harmed children (Blimpo et al., 2022), while recent work from Colombia and India highlights that the design of teacher supports and accountability systems determines whether expanded preschool access translates into developmental benefits (Andrew et al., 2024). By embedding our intervention within government

delivery structures and explicitly varying workload relief, our study provides rare causal evidence on how to organize large-scale programs in ways that both expand coverage and sustain quality.

Taken together, our results speak to the broader policy debate on how scarce resources should be used in early childhood systems. They show that relatively low-cost reforms, when delivered through existing infrastructure for example, public schools, can improve child outcomes by addressing both information gaps for parents and the heavy workload teachers face. The differences across treatment arms also point to an important lesson: how programs are organized matters as much as what they contain. Interventions that ease teachers' administrative and classroom burdens while keeping them central to engaging children and parents deliver the most consistent gains, whereas splitting these responsibilities across different actors can dilute impact. For policymakers, the implication is that scaling early childhood programs requires attention not only to pedagogy and curriculum but also to the institutional choices that determine whether teachers and parents work together or in isolation.

2 The Background

Our intervention is situated in fourteen municipalities of Jhapa District in southeastern Nepal.[3] Jhapa is Nepal's easternmost district and, according to the 2021 census, is home to 998,054 people, of whom 478,509 are male and 519,545 are female. The age distribution is skewed toward younger cohorts: more than 250,000 children are between the ages of 0 and 14, around 670,000 individuals are in the working-age bracket of 15 to 64, and roughly 77,000 are 65 years or older.[4] This demographic structure highlights both the urgency and the potential gains from investments in early childhood development (ECD), as a large cohort is entering school and will transition into the labor force over the next decade.

Nepal has made impressive progress in expanding access to early childhood services over the last two decades. Enrollment in ECD centers rose from 12 percent in 2000 to 86 percent in 2017 (Poudyal et al., 2019). By 2017, over 36,000 ECD centers were serving nearly one million children (World Bank, 2020). The share of grade one entrants with prior ECD experience more than doubled between 2007 and 2017, rising from 33 to 66 percent. The Constitution of Nepal enshrines the right to early childhood development, and the government has committed to universal access by 2030. These expansions, how-

[3]The fourteen municipalities are: Arjundhara Nagarpalika, Barhadashi Gaunpalika, Bhadrapur Nagarpalika, Buddhashanti Gaunpalika, Damak Nagarpalika, Gauradhaha Nagarpalika, Gauriganj Gaunpalika, Haldibari Gaunpalika, Jhapa Gaunpalika, Kachankawal Gaunpalika, Kamal Gaunpalika, Kankai Nagarpalika, Mechinagar Nagarpalika, and Shivasatakshi Municipality.

[4]Central Bureau of Statistics Nepal (2021).

ever, have been financed with limited resources: spending on ECD is still below 0.1 percent of GDP and accounts for only 1 to 3 percent of the education budget. As a result, quality has lagged behind quantity. UNICEF's Early Child Development Index shows that in 2014 fewer than one third of Nepali children aged 36 to 59 months were developmentally on track in literacy and numeracy, and only 64 percent were on track in the social-emotional domain (Poudyal et al., 2019). These figures illustrate the limits of enrollment-driven progress and underscore the need to focus on service quality.

Several structural challenges explain the limited effectiveness of Nepal's ECD system. Teachers and facilitators often lack adequate training in developmentally appropriate pedagogy, and there are few opportunities for professional development or supervision. Resource constraints are acute: teaching materials are scarce, infrastructure is inadequate, and funding levels are well below international norms. Furthermore, knowledge gaps among parents also limit program effectiveness. Many parents are not aware of critical practices for child development, such as proper maternal nutrition, the benefits of facility-based childbirth, exclusive breastfeeding, and the importance of play and stimulation in early years (Poudyal et al., 2019; UNICEF, 2017). Finally, social barriers including gender discrimination and the exclusion of children with disabilities remain pervasive in both households and classrooms, reducing the inclusivity of ECD services.

To address these gaps, the Government of Nepal introduced the School Sector Development Plan (SSDP) in 2017, a seven-year framework that aligns the education sector with the Sustainable Development Goals. The SSDP emphasizes teacher training and professional development, with roughly 70 percent of the budget allocated to training and teacher management. It also highlights persistent shortages of qualified teachers, high student-teacher ratios, and limited resources as critical bottlenecks. Although Nepal introduced a national curriculum for ECD in 2007, it has not been formally evaluated, and most teachers have not been adequately oriented to its content (Government of Nepal, 2016; Poyck, 2016). Thus, curriculum reform and teacher professionalization remain central priorities for improving ECD outcomes.

Our intervention builds directly on these national priorities. It is designed to address key constraints highlighted in the SSDP, including gaps in curriculum implementation, shortages of trained teachers, and limited resources for effective service delivery. By embedding the program within Nepal's existing policy framework and implementing it through Seto Gurans, a local nonprofit with long-standing expertise in early childhood development, we test a model that is both context-specific and scalable. Importantly, the intervention was developed in close collaboration with the Govern-

ment of Nepal, ensuring that the study speaks directly to ongoing debates about how best to translate near-universal enrollment into meaningful improvements in learning and developmental outcomes.

Our first and most important contribution is to provide rigorous evidence on whether strengthening staffing, curriculum, and resources within Nepal's public ECD system can improve state capacity to deliver high-quality early childhood services at scale. In doing so, the study moves beyond documenting access to examine how system-embedded reforms can translate into sustained improvements in children's developmental outcomes. The evidence is thus directly relevant for policymakers seeking to convert rapid enrollment gains into lasting human capital investments.

3 Experimental Design and Method

3.1 The Intervention

The intervention is motivated by persistent gaps in knowledge and awareness about early childhood development (ECD) among both teachers and parents, particularly in low- and middle-income countries. A growing body of research highlights that insufficient understanding of child development during the formative early years has long-term consequences for cognitive, socio-emotional, and health outcomes, and can contribute to the perpetuation of intergenerational cycles of poverty and inequality (Elango et al., 2015; Garcıa et al., 2023). These challenges are especially salient in Nepal, where rapid expansions in access to ECD services have not been matched by comparable improvements in quality. The central concern is no longer whether children attend preschool, but whether the services they receive are sufficiently effective to generate sustained improvements in learning and development. The intervention was implemented in collaboration with the Ministry of Education and the curriculum was executed through Seto Gurans Child Development Services, a leading local nonprofit organization specializing in ECD in Nepal.[5] Leveraging its expertise and community networks, Seto Gurans facilitated the delivery of the program, ensuring cultural and contextual relevance.

Our intervention was designed to address three key barriers to improving early childhood development outcomes: (1) insufficient training and capacity building for teachers, (2) limited parental

[5]Seto Gurans Child Development Services, a pioneer non-profit Non Government Organization, has been at the forefront in the field of early childhood development (ECD) to ensure the rights of children, especially from underprivileged and marginalized community. We are committed to the ideals of child centered development approaches and a belief in the rights of all children to grow their full potential – physically, emotionally, socially and intellectually. We believe in every action on the behalf of the children — such as sponsorship, signing a petition or offering a donation — can change the life of many children at risk and support their families so as to create a better future of the nation and the world.

knowledge and engagement, and (3) inadequate classroom resources and support mechanisms. We address these barriers through a clustered randomized controlled trial employing three distinct treatment arms, each targeting a specific aspect of early childhood development.

3.2 Treatment Arms

We randomized a sample of 201 schools into the following four arms:

3.2.1 Treatment Arm 1: Teachers Training

In this Treatment Arm 1 T1), 50 schools were randomly selected to receive targeted intervention in the form of a training for teachers to improve early childhood development outcomes. The teacher training program spans 15 days, with participants engaging in sessions lasting 5-7 hours each day. The first 10 days focus on Teacher Professional Development (TPD) training, covering critical topics such as the importance of early childhood development, national minimum standards for ECD, and the role of play materials in fostering learning and growth. These sessions are delivered through a mix of interactive methods, including discussions, group work, and lectures, ensuring an engaging and comprehensive learning experience. In the final five days of training the focus shifts to a parental education model. During this phase, teachers are equipped with the skills and knowledge necessary to conduct educational sessions for caregivers at their respective ECD centers. This segment emphasizes practical application, as teachers prepare to use their training to facilitate meaningful engagement with parents, fostering a collaborative approach to early childhood development.[6]

After completing the training, the trained teacher conducted 20 parental education sessions over six months at the community level. Each session lasted two hours and was attended by the primary caregiver - typically the parent or guardian who spends the most time with the child. These sessions were organized for caregivers of children enrolled in the selected schools and designed to address gaps in knowledge as well as to foster greater caregiver engagement in their children's developmental processes. The content of these sessions was comprehensive, covering a wide range of topics that are pivotal to early childhood development. Key focus areas included health and nutrition, emphasizing the importance of a balanced diet, immunizations, and preventive healthcare measures. Hygiene practices were also a central theme, with discussions on maintaining clean environments to reduce the risk of infections and illnesses common in early childhood. Additionally, the sessions addressed the

[6] Appendix C provides details on the modules discussed during in the TPD training sessions.

identification and support of children with disabilities, aiming to equip caregivers with the knowledge to recognize early signs of developmental delays and provide appropriate care or seek timely interventions. Another critical component was the emphasis on cognitive and emotional stimulation, where caregivers learned practical strategies to engage children through play, storytelling, and other interactive activities that promote learning and social skills. [7]

3.2.2 Treatment Arm 2: Teachers Training + Inside Classroom Helper

In this Treatment Arm 2 (T2), 50 schools were assigned a trained Early Childhood Development (ECD) teacher along with an additional in-classroom helper (hereafter referred to as the "helper"). The ECD teacher's primary responsibility included conducting 20 structured parental-education sessions with the caregivers of children in our sample. These sessions aimed to enhance parents' understanding of early childhood development and their role in supporting their child's cognitive, emotional, and social growth. The content and structure of these sessions mirrored those delivered in the first treatment arm (T1), ensuring consistency in the curriculum across treatment groups.

By adding classroom helper, we aimed to address the dual challenges of teacher workload and effective classroom management. Hired on a seven-month contractual basis, the helper assisted the teacher with day-to-day classroom activities, enabling the teacher to focus more effectively on delivering high-quality instruction and individualized attention to students. By providing additional support, helpers were critical in ensuring that the intervention was implemented smoothly and that classroom operations were not disrupted during the teacher-led parental sessions.

3.2.3 Treatment Arm 3: Teachers Training + Outside Classroom Helper

The 50 schools in this Treatment Arm 3 (T3) received a trained teacher along with an additional outside classroom helper (henceforth referred to as the "facilitator"). This design differs from Treatment Arm 1 (T1) in that the facilitator, rather than the trained teacher, was responsible for conducting the parental education sessions as part of the intervention. This treatment allows us to study the relative effectiveness of delegating these sessions to a specialized facilitator versus integrating them into the responsibilities of the classroom teacher.

Facilitators were recruited on a contractual basis and underwent targeted training to prepare them

[7] Appendix D provides details on the modules discussed during the parental education sessions.

for their role. The training focused on equipping them with the skills and knowledge necessary to conduct parental education sessions effectively, with an emphasis on fostering parental understanding of early childhood development. The curriculum for these sessions mirrored those delivered in T1, covering topics such as the importance of cognitive stimulation, nutrition, health practices, and fostering a supportive home environment. By adding facilitators, we aimed to alleviate the burden on teachers, allowing them to focus on classroom instruction while still ensuring that parental engagement - a critical component of early childhood development - was adequately addressed.

3.2.4 Control Group

The 51 schools in this arm served as the control group and did not receive any intervention in the form of teacher training or parental-education sessions - this group was business as usual.

3.3 Conceptual Framework

Early childhood development is a critical determinant of human capital and long-term economic outcomes. A substantial body of research shows that early experiences shape cognitive, socio-emotional, and health trajectories, which in turn influence educational attainment, labor market productivity, and intergenerational mobility (Grantham-McGregor et al., 2007; Walker et al., 2007; Heckman and Karapakula, 2019). The period from conception through early childhood lays the foundation for future skill acquisition, and deficits during this stage often lead to persistent disadvantages. Recent work emphasizes the high returns to investments in early education, particularly in low- and middle-income countries where foundational learning gaps are large (Muralidharan and Sundararaman, 2013; Duflo et al., 2015, 2024). Within this literature, four domains are consistently highlighted as central to child development: education, caregiving, health, and nutrition (Black et al., 2017). Our intervention focuses on the education and caregiving dimensions, with particular attention to teacher capacity, parental engagement, and the adequacy of classroom support.

A growing literature highlights both the promise and the limits of expanding early childhood programs in low-resource settings. Experimental evidence from The Gambia shows that expanding access to community-based preschool raised enrollment but generated limited improvements in learning without complementary quality enhancements (Blimpo et al., 2022). Similarly, evidence from India further indicates that while kindergarten enrollment can produce large short-run cognitive benefits, the persistence and magnitude of these effects depend critically on children's counterfactual

care arrangements, with the largest gains accruing to those who would not otherwise have attended preschool (Dean and Jayachandran, 2020). Furthermore, cross-country research also emphasizes that the quality of provision—including teacher practices, curriculum, and classroom support—is a central determinant of impact (Andrew et al., 2024). Taken together, this evidence suggests that expanding access alone is insufficient; improvements in quality and alignment with system constraints are essential for durable effects.

Within this debate, two approaches have received particular attention: *strengthening teacher capacity* and *fostering parental engagement*. Training programs that improve teachers' pedagogical skills can enhance classroom instruction, while parental education and stimulation programs have been shown to improve home learning environments and child outcomes (Elango et al., 2015; Garcıa et al., 2023). Evidence from Rwanda demonstrates that scalable parenting interventions can meaningfully improve caregiver practices and child development, even in resource-constrained settings (Justino et al., 2023). Combining teacher training with parental engagement is therefore a promising strategy for improving outcomes, though its effectiveness depends on program delivery and the ability to reduce workload constraints that teachers often face in practice.

One strategy for addressing these constraints is to provide additional personnel to relieve teachers of administrative or classroom management responsibilities. Recent experimental evidence from India's Integrated Child Development Services shows that adding a dedicated early childhood facilitator doubled instructional time and led to significant improvements in children's learning and nutrition, while remaining highly cost-effective (Ganimian et al., 2024). This highlights the potential of staffing interventions that augment, rather than replace, existing systems of service delivery. At the same time, research cautions that simply increasing inputs does not guarantee better outcomes; the effectiveness of additional staff depends on integration, accountability, and alignment with teacher incentives (Duflo et al., 2015; Mbiti et al., 2019).

A related question is whether specialization and division of labor improve program effectiveness. Economic theory suggests that assigning tasks according to comparative advantage can improve efficiency (Glewwe et al., 2010; Cook and Mansfield, 2016), but evidence on specialization in education is mixed (Fryer Jr., 2018; Dee and Cohodes, 2008). In early childhood settings, classroom instruction and parental engagement are often complementary: insights from one domain inform the other, and separating these roles too rigidly may reduce overall effectiveness.

In sum, the existing literature suggests several potentially offsetting forces. Reducing workload

through additional staff may improve quality but could also reduce teacher effort. Specialization in tasks may increase efficiency but risk weakening complementarities between instruction and parental engagement. These uncertainties underscore the importance of experimental evidence on how best to design ECD programs in low-resource contexts. Our study contributes to this debate by evaluating whether system-embedded reforms in Nepal—focused on teacher training, parental engagement, and classroom support—can strengthen state capacity to deliver high-quality early childhood services at scale.

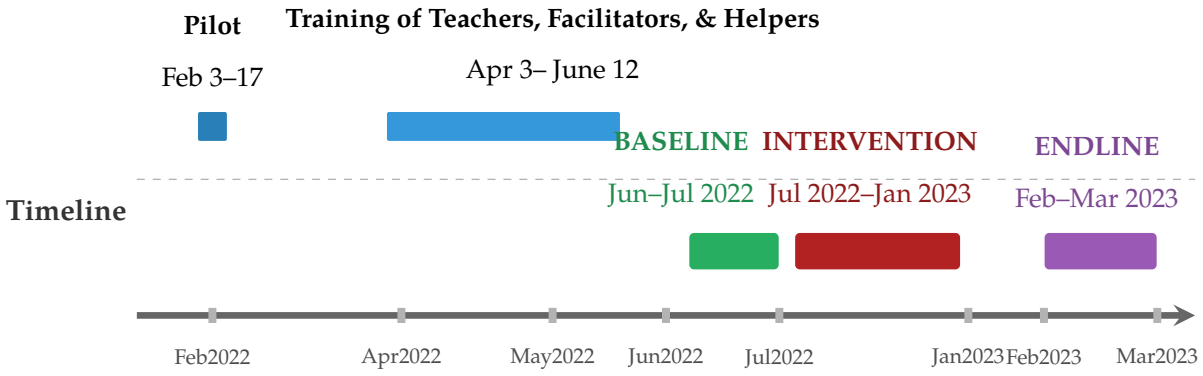
3.4 Sample Selection, Randomization, Training, and Timeline

Sample Selection and Randomization: This study was conducted in Jhapa, selecting schools from all fifteen municipalities in the district. A total of 201 schools with Early Childhood Development (ECD) sections were chosen and randomly assigned to different treatment and control arms (see Figure A1). Specifically, 50 schools were allocated to each of the three treatment arms, while 51 schools were assigned to the control group. To form the study sample, 3,131 children from ECD sections were selected using a systematic random sampling approach. Every fifth child on the admission list was selected until 20 children were enrolled per school. In schools with fewer than 20 enrolled children, all ECD students were included in the sample, ensuring comprehensive representation across varying school sizes.

Training: To ensure the effective implementation of this intervention, a structured training program was developed to build the capacity of key stakeholders. The process began with a training pilot conducted from February 3–17, 2022, aimed at refining and contextualizing training materials to improve their relevance and effectiveness. This was followed by a series of targeted capacity-building sessions designed to equip educators and facilitators with the necessary pedagogical expertise and practical skills for successful program delivery. The Early Childhood Development (ECD) teacher training, held from April 3–12, 2022, focused on evidence-based instructional strategies to support early learning, followed by Physical Education (PE) teacher training from May 29 to June 2, 2022, which provided educators with methodologies for integrating physical activity into the curriculum. To further strengthen program delivery, PE facilitator training was conducted from June 4–10, 2022, followed by classroom helper training from June 12–14, 2022, ensuring adequate support structures were in place across participating schools. This multi-stage training approach aimed to improve instructional quality, ensure consistency in program implementation, and foster a supportive learning

environment across the study schools.

Timeline: Baseline data collection which lasted ≈ 55 minutes was conducted between June 1 and July 22, 2022, during which primary caregivers of sampled children were surveyed (see Figure below). Primary caregivers were defined as the adults who spent the most time with the selected child, and surveys were administered either at caregivers' homes or on school premises, depending on logistical feasibility. Following the baseline, a six-month intervention was implemented from July 2022 to January 2023, consisting of 20 ECD sessions for caregivers. These sessions were delivered by trained ECD teachers or facilitators, based on the assigned treatment arm, while control schools did not receive any intervention. Endline data collection which lasted ≈ 49 minutes took place from February 9 to March 4, 2023, surveying the same primary caregivers across all treatment and control arms. Additionally, the study included direct observations of teacher-child interactions in all sample schools during the endline assessment.



4 Data Collection, Outcomes Measures, and Validity of the Experimental Design

4.1 Baseline Survey

Baseline data were collected over two months, from June to July 2022. The survey was administered through in-person interviews to 3,131 primary caregivers of the selected students, defined as those responsible for the child's day-to-day care. On average, each interview lasted about 33 minutes. Trained enumerators collected data in all 201 treatment and control schools across 15 municipalities. The questionnaire was administered in the local language, following a rigorous translation process and bench testing. Survey modules covered demographic information, household amenities, health status and beliefs (including disability and related conditions), parental stress, emotional well-being, and care-

giving practices. These data provide a baseline on caregiver abilities, confidence, and attitudes. We also constructed composite caregiver outcomes, including a stress index and measures of practices related to early childhood development (ECD).

4.2 Classroom Facilities Check

In addition to the baseline caregiver survey, we conducted a classroom facilities check in 53 schools. This instrument was administered to teachers through in-person interviews, with each interview lasting approximately 12–15 minutes. The survey gathered information on water and sanitation facilities, teacher follow-up systems, lesson preparation practices, language and creativity development, and overall infrastructure. It also collected enrollment figures and identified the number of students with disabilities. From these data we constructed a Classroom Facilities Index, aggregating indicators of school infrastructure and teaching practices. This exercise provided a systematic baseline measure of facility quality and the educational environment across sampled schools.

4.3 Student–Teacher Interaction

At endline, we complemented survey data with a structured classroom observation to assess teacher–child interactions. Trained enumerators conducted twenty one-minute observations within a two-hour classroom window, each followed by a four-minute period to record assessments. The protocol focused on established best practices for early childhood education. To minimize bias, teachers were not informed about the specific aspects being observed or the evaluation criteria. These observations provide a direct measure of the quality of classroom interactions and the implementation of ECD practices in study schools.

4.4 Parental Engagement Sessions

We adopted a participatory approach to encourage parents and caregivers to reflect on existing practices and explore alternatives. The Participatory Education (PE) content comprised 30 topics organized under five components: the role of ECD caregivers, stages of child development, health and nutrition, child protection and care, and early learning. Each session lasted about two hours and was facilitated by a separate team of trained enumerators in community settings. Of the 30 topics, 18 were jointly selected and implemented with the World Bank Group and *Seto Gurans* NCDS as part of the

Support for Nepal Early Childhood Development Study. Two additional sessions focused specifically on disability were developed and delivered. In total, 20 PE sessions were conducted. Information from these sessions was used to construct the Practice of Early Stimulation and Learning (PESL) Index, reflecting caregiver participation in stimulation and early learning practices.

4.5 Endline Survey

The endline survey was conducted from February to March 2023 with 3,004 of the primary caregivers originally interviewed at baseline. On average, interviews lasted about 29 minutes. The questionnaire mirrored the baseline design, covering demographic characteristics, household amenities, health status and beliefs (including disability), parental stress, emotional well-being, and caregiving practices. These data form the basis for constructing the first- and second-stage outcome indices used in our analysis.

4.6 Outcome Measures

First Stage Outcomes: We begin by establishing the impact of the intervention on teacher–student interactions and the availability of essential classroom facilities. To assess teacher–student interactions, trained enumerators conducted 20 structured observations within a two-hour window in each classroom using a standardized protocol. Each observation consisted of a one-minute snapshot assessing teacher–child interactions based on established best practices in early childhood development (ECD), followed by a four-minute period for recording assessments. Teachers were not informed about the specific aspects being evaluated, thereby minimizing the risk of altered behavior during the observation.

From these observations, we constructed two indices: the Positive Interaction Index and the Negative Interaction Index. The Positive Interaction Index captures desirable teacher behaviors that foster an engaging and supportive classroom environment, such as reading to groups, facilitating discussions, and showing positive affect toward students. The Negative Interaction Index, by contrast, measures undesirable behaviors such as reliance on negative discipline or disengagement. For both indices, data were aggregated across the 20 observations per classroom, summed, and standardized relative to the control group.[8] To complement these measures, we constructed the Classroom Facilities Index to assess the physical quality of ECD classrooms. This index was based on a structured

[8] Appendix E.2 provides details on the variables used in the construction of the Positive and Negative Interaction Indices.

checklist of essential infrastructure and resources, with each item scored dichotomously (1 if present, 0 if absent). The total score was standardized relative to the control group to yield the final index.[9]

Child-level Outcomes: We measure child development using the Ages and Stages Questionnaire (ASQ), a widely used developmental screening tool. The ASQ evaluates children across five domains: communication, gross motor skills, fine motor skills, problem-solving, and personal–social development. Each response follows the standard ASQ scoring method: 10 points for "Yes," 5 for "Sometimes," and 0 for "Not Yet." Domain-specific scores are computed by summing items within each section, while an aggregate ASQ score is calculated by summing across all five domains. All scores are standardized relative to the control group, yielding six outcome measures: (i) aggregate ASQ score, (ii) communication, (iii) gross motor, (iv) fine motor, (v) problem-solving, and (vi) personal–social.[10] Although the ASQ is widely applied in psychology and pediatric research, its use in economics is less common, with notable exceptions including López Bóo and Creamer (2019); Araujo et al. (2019); Rubio-Codina et al. (2015).

Compared to alternative instruments such as the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) or the Developmental Indicators for the Assessment of Learning (DIAL-4) (Dean and Jayachandran, 2020), the ASQ offers several advantages: it is cost-effective, relatively easy to administer, and highly adaptable across contexts. Its design allows for comprehensive assessment of multiple developmental domains while tailoring the instrument to children's ages. Unlike standardized assessments requiring trained professionals, the ASQ relies on caregiver reporting, thereby drawing on daily observations that can reduce observer bias and capture behaviors not readily visible in school or clinical settings. This feature makes it particularly valuable for large-scale studies in low-resource contexts where direct assessments such as the Bayley Scales of Infant Development (Bayley, 2006) may be impractical due to high costs and specialized training requirements. Beyond measurement, the ASQ also functions as an intervention tool by raising caregiver awareness and engagement in child development.[11]

Caregiver Outcomes: To complement child assessments, we collected survey data from the primary caregivers of sampled children to measure knowledge, practices, and attitudes related to ECD. The survey modules examined caregiver–child engagement, caregiver stress, beliefs about discipline, and atti-

[9] Appendix E.2 presents the checklist used in the construction of the Classroom Facilities Index.

[10] Appendix E.3 provides details on the variables used to construct ASQ scores across domains.

[11] ASQ's cultural adaptability and validation across diverse populations make it suitable for cross-context research. With high sensitivity and specificity, it reliably identifies at-risk children, ensuring accurate measurement of developmental progress.

tudes toward disability. Caregiver engagement was measured using the Practice of Early Stimulation and Learning (PESL) Index, which captures whether caregivers engage in activities such as reading books, telling stories, singing, taking the child outside, playing, or practicing early learning activities such as naming, counting, or drawing. Responses were coded as binary (1 for Yes, 0 for No), summed, and standardized relative to the control group. To capture frequency, we also constructed the PESL Intensity Index, which records how often these activities occurred per week (1–3 days = 1, 4–5 days = 2, 6+ days = 3), with totals again standardized relative to the control group. Caregiver stress was measured through a seven-item scale assessing perceptions of reinforcement from the child, emotional connection, the alignment between expectations and reality, interpretation of the child's behavior, and overall confidence in caregiving. Responses were recorded on a five-point Likert scale ranging from Strongly Agree (1) to Strongly Disagree (5). Scores were summed and standardized relative to the control group to generate the Caregiver Stress Index.[12]

Beliefs about discipline were assessed through questions on whether caregivers view spanking as necessary or normal and whether they reported using spanking in the previous 14 days. Attitudes toward disability were measured with four questions—three binary and one Likert-scaled—summed and standardized to form the Attitude to Disability Index. Finally, caregiver confidence in supporting children with disabilities was measured using Likert-scale questions on knowledge and ability. These responses were summed and standardized relative to the control group to form the Confidence Disability Index.[13]

4.7 Validity of the Experimental Design

4.7.1 Descriptive Statistics

We report descriptive statistics for the study sample in Column 1 of Table A1. Children are on average 48 months old (SD $\approx$ 12), with roughly equal shares of boys and girls. Households are moderately sized, with about three adults and 1.3 siblings on average, reflecting the relatively large household structures common in low-income settings. The primary caregiver is female in 84 percent of cases, and caregivers have completed the equivalent of six to eight years of schooling, suggesting modest but incomplete parental education. Baseline measures of child development and caregiver practices are standardized around zero, though the variation is considerable: the aggregate ASQ score averages

[12] Appendix E.4 details the variables used in the construction of the PESL and Stress Indices.

[13] Appendix E.5 provides details on the variables used in the construction of the Attitude to Disability and Confidence Disability indices.

0.04 (SD 0.95), while the Practice of Early Stimulation and Learning (PESL) index averages 0.04 (SD 0.99), pointing to uneven exposure to learning activities at home. Caregiver well-being also shows dispersion, with the Stress Index centered at 0.07 (SD 1.07) and attitudes toward disability slightly negative on average (–0.10, SD 0.93), indicating moderate stress levels and some barriers to inclusivity. Overall, these statistics describe children entering preschool at about four years of age, most often cared for by mothers with limited schooling, and growing up in households where both resources and caregiving practices differ markedly across families.

4.7.2 Baseline Balance

We present baseline balance for the final analysis sample across treatment arms in Columns 2–8 of Table A1. Panel A reports demographic and household characteristics for children and caregivers. The average child is approximately 48 months old, and about half are female. Households include, on average, three adults and 1.3 siblings. The primary caregiver is female in 84% of cases and has an average educational attainment equivalent to grades 6–8. Columns (2) through (5) report means by treatment arm, while columns (6) to (8) present mean differences relative to the control group. Overall, demographic characteristics are well balanced across treatment arms.

Panel B focuses on baseline developmental outcomes and caregiver attitudes. Most indices are balanced across groups. We observe some differences in the index measuring "attitudes towards disability" and in the baseline "PESL Index". However, there is no consistent pattern across related measures, and the magnitude of these differences is small relative to overall variation. Given the number of comparisons, such differences are likely attributable to chance rather than systematic imbalance. Overall, the balance results are consistent with successful randomization and suggest that any differences observed in outcomes can be interpreted as causal effects of the intervention.

4.7.3 Attrition and Compliance

Approximately 5% of the baseline sample (127 out of 3,131 children) did not participate in the endline assessment. Although modest, this attrition could affect the internal validity of the results. In Section 6.5, we test whether attrition is systematically associated with potential bias. In addition, 20 of the 150 treatment schools did not implement PE sessions as part of their curriculum, resulting in non-compliance. We report average treatment effects in an intent-to-treat framework, which are unaffected by compliance rates. Nonetheless, in Section 6.7 we also examine the baseline characteristics of these

schools and their students to assess whether noncompliance may influence the interpretation of our findings.

4.8 Deviations from the Pre-Analysis Plan

Our analysis follows the Pre-Analysis Plan (PAP) registered at the AEA RCT Registry (AEARCTR-0011318), which specified primary outcomes, index construction, multiple-hypothesis corrections, empirical specifications, and attrition protocols, with minor modifications necessitated by field conditions. Most notably, we exclude baseline controls from main specifications because the COVID-19 pandemic disrupted baseline data collection, leaving substantial missing data that would reduce the effective sample by about 30%; following McKenzie (2012), we rely on randomization alone to preserve statistical power, and robustness checks with baseline controls for primary outcomes is reported in Appendix Table A2. We also extend the PAP by disaggregating treatment effects across implementation models ("training only" versus "training plus additional support"), which reveals meaningful heterogeneity (Banerjee et al., 2020); by standardizing variable coding so that positive coefficients uniformly indicate improvements; and by adapting ASQ scoring from narrow age-specific cutoffs to broader developmental categories, enhancing comparability across our heterogeneous sample. Finally, we examine outcomes of direct policy relevance identified during fieldwork, including the share of children below developmental thresholds, as well as spillovers and heterogeneity by age and baseline status. These deviations reflect pandemic disruptions and field insights while maintaining the integrity of the experimental design.

5 Empirical Specification

We estimate the intent-to-treat (ITT) impact of assigning a trained teacher to ECD classrooms, first by pooling all treatment arms together (Teacher Training, Teacher Training with an Inside Classroom Helper, and Teacher Training with a Facilitator, relative to the control) and then separately by treatment arm. The pooled specification is:

$$Y_{i,s,t=1} = \beta_0 + \beta_1 T_s + \beta_2 Y_{i,s,t=0} + \epsilon_{i,s} \tag{1}$$

where $Y_{i,s,t=1}$ denotes the outcome for individual (student or parent) i in school s measured post-

treatment, and $Y_{i,s,t=0}$ is the corresponding baseline value. T_s is an indicator for schools assigned to the treatment group, and $\epsilon_{i,s}$ is the error term. Standard errors are clustered at the school level to account for within-school correlation and because treatment was assigned at that level.[14] The coefficient of interest, β_1, estimates the ITT effect of access to a trained teacher in the ECD classroom.

We next estimate ITT impacts separately by treatment arm, relative to the control. In this specification, indicators are included for assignment to each of the three treatment groups: Teacher Training (T1), Teacher Training with an Inside Classroom Helper (T2), and Teacher Training with a Facilitator (T3). All other covariates are defined as in Equation 1, including baseline outcomes where available. The coefficients β_1, β_2, and β_3 estimate the ITT effects for each treatment arm relative to the control group.

6 Results

Our analysis examines the effects of the intervention on classroom quality, child development, and caregiver practices. We begin with immediate program outcomes, focusing on changes in classroom environments and teacher–student interactions. We then turn to our primary measures: children's developmental progress and caregiver engagement. Finally, we analyze shifts in caregiver beliefs and attitudes toward discipline and disability. Across all outcomes, we compare effects by treatment arm to assess how different implementation approaches influence early childhood development.

Because we evaluate outcomes across multiple domains, there is a risk of false positives from multiple hypothesis testing. To address this concern, we apply the False Discovery Rate (FDR) correction suggested in Benjamini and Hochberg (1995) and report that in Table 3.

6.1 Impact on Classroom Environments and Teacher Capacity

Panel A of Table 1 reports the estimates for any treatment, Panel B reports the estimates for Training and Training plus any form of help, and Panel C reports the estimates disaggregated by the specific type of help.

We first examine the intervention's effects on the material environment of ECD classrooms, which provide the foundation for effective instruction. Adequate books, toys, learning aids, and basic infras-

[14] We report the estimates from Equation 1 with baseline controls $Y_{i,s,t=0}$ in Appendix Table A2.

tructure are essential for supporting developmentally appropriate pedagogical practices, yet are often lacking in resource-constrained contexts. Panel A of Table 1 shows that treatment schools experienced a striking improvement in these dimensions: the Classroom and Facilities Index increased by 0.91 SD relative to control schools ($p < 0.01$). This index aggregates essential inputs including books, educational toys, instructional aids, and classroom infrastructure, capturing the readiness of classrooms to deliver stimulating and age-appropriate learning opportunities. The magnitude of this effect highlights that relatively modest interventions aimed at teacher training and support can yield meaningful improvements in the material learning environment, which in turn are likely to influence instructional quality and children's engagement. Prior work has emphasized that learning materials and infrastructure alone rarely translate into gains unless teachers are supported in using them effectively (Banerjee et al., 2007; Mbiti et al., 2019).

Disaggregation by treatment arm (Panels B and C) reveals heterogeneity in program impacts, consistent with the conceptual framework on workload constraints. The Training + Helper arm generated the largest improvement in classroom facilities (1.14 SD, $p < 0.01$), significantly larger than the Training + Facilitator arm (0.60 SD, $p < 0.01$), with the difference between the two arms itself statistically significant ($p = 0.03$). The Training-only arm also produced substantial gains (0.97 SD, $p < 0.01$). These results suggest that in-class support may be particularly effective in freeing teachers from administrative and managerial tasks, enabling them to devote greater effort to organizing and sustaining classroom resources. This interpretation aligns with research showing that support personnel can shift teacher time allocation toward more productive activities (Duflo et al., 2015; Ganimian et al., 2024). At the same time, the relatively smaller gains in the Facilitator arm underscore that not all forms of support are equally effective: the positioning of additional staff inside versus outside the classroom may determine whether they complement or dilute teacher effort. This pattern is consistent with evidence that additional staffing improves outcomes only when roles are well integrated into the classroom and accountability structures are clear (Banerjee et al., 2007).

Turning to student attendance, the results present a more nuanced picture. Only the Training-only arm produced significant improvements in attendance, with a 0.56 SD increase ($p < 0.05$). By contrast, neither of the arms that included additional support staff generated detectable effects. One possible interpretation is that in the absence of supplemental personnel, trained teachers in the Training-only arm had stronger incentives to engage directly with families to ensure children's consistent attendance, as their own classroom effectiveness depended on it. In contrast, when helpers or facilitators were present, teachers may have placed less emphasis on family outreach, or classrooms may have expe-

rienced short-term adjustment costs from integrating new staff. These findings are consistent with studies showing that teacher effort and student contact time are highly sensitive to work organization and incentives (Kremer et al., 2005; Muralidharan et al., 2017).

Taken together, the results suggest that while the provision of additional personnel can substantially improve the classroom environment, it may also reallocate teacher effort away from complementary activities such as promoting attendance. Importantly, the improved material environments and changes in attendance patterns documented here establish the foundation for the improvements in teacher–student interactions and child development outcomes that we examine in subsequent sections.

6.2 Improvements in Teacher–Child Interactions

Beyond improvements in classroom materials, we examine whether the intervention transformed classroom dynamics by improving teacher–child interactions. Panel A of Table 2 shows that treatment classrooms experienced a 0.49 SD increase in positive interactions ($p < 0.01$) and a 0.57 SD decline in negative interactions ($p < 0.01$) relative to controls. These shifts reflect substantial behavioral changes: teachers in treatment schools were more likely to read to groups, facilitate conversations, and display warmth and attentiveness, while relying less on harsh discipline and showing reduced disengagement. The magnitude of these changes suggests that the training translated into meaningful improvements in classroom practice, producing environments aligned with developmental best practices. This is consistent with a broad literature underscoring the central role of teacher–child interactions in shaping early learning outcomes. Seminal frameworks such as CLASS emphasize that emotionally supportive and instructionally rich interactions are strong predictors of child development (Pianta et al., 2008), while empirical evidence from Ecuador demonstrates that variation in teacher quality—as captured through observed interaction quality—has large effects on kindergartners' cognitive and socio-emotional development (Araujo et al., 2016). Multi-country evidence further highlights that pedagogical quality, rather than mere access, is the critical determinant of preschool effectiveness (Andrew et al., 2024), and caregiver-engagement interventions likewise demonstrate the importance of nurturing interactions (Justino et al., 2023).

Panels B and C of Table 2 show that improvements in teacher–child interactions were consistent across all three treatment arms, with no statistically significant differences ($p > 0.7$). This suggests that the common training curriculum, rather than the support of additional personnel, was the key

driver of improved interaction quality. Put differently, while helpers improved the physical classroom environment, the pedagogical training itself was sufficient to shift teacher practices. These findings align with evidence that structured professional development can raise instructional quality in low-resource settings. Meta-analyses of teacher coaching report large improvements in classroom practice and student outcomes (Kraft et al., 2018), and experimental evidence from Ghana shows that preschool teacher training improved both interactions and child development (Wolf et al., 2019). Our results reinforce this literature, highlighting that relatively modest but well-structured training can produce sizable changes in teacher behavior and the overall socio-emotional climate of classrooms (Banerjee et al., 2007; Duflo et al., 2015; Ganimian et al., 2024).

6.3 Impacts on Children's Development and Caregiver Engagement

Panel A of Table 3 reports estimates for any treatment, Panel B separates Training from Training plus any form of help, and Panel C disaggregates by the specific type of help. Panel A presents the main results on child and caregiver outcomes. We find that relative to the control group, children in treatment schools experienced a 0.13 SD improvement in the aggregate ASQ score ($p = 0.07$). Put differently, children in treated classrooms performed about 13% of a standard deviation better on composite developmental measures. While modest in size, this effect is consistent with evidence that early childhood programs generating gains of 0.09 to 0.15 SD can be cost-effective and generate long-term returns (Magnuson and Duncan, 2016). Moreover, recent scholarship on interpreting effect sizes in education suggests that impacts of this magnitude—which would be considered "small" by traditional Cohen's benchmarks—are actually meaningful when evaluated against the distribution of effects from rigorous studies of education interventions (Kraft, 2020). This interpretation aligns with meta-analytic evidence showing that early intervention programs produce average effects of 0.45 SD (Gómez-Cotilla et al., 2024), with many effective programs—particularly those focused on parenting practices without responsive caregiving—generating impacts of 0.11 SD or less (Jeong et al., 2021). The observed effect in our study reflects gains across multiple developmental domains, including communication, motor skills, problem-solving, and socio-emotional development, with some domains showing stronger improvements than others.

We also find improvements in caregiver engagement. The Practice of Early Stimulation and Learning (PESL) Index improved by 0.13 SD ($p = 0.05$), indicating that caregivers in treatment households were more likely to read with their children, tell stories, sing, play, and engage in simple educational

activities such as naming, counting, or drawing. These results suggest that teacher training not only strengthened classroom practices but also transmitted strategies to parents, thereby creating complementary channels of developmental support. Importantly, the program did not increase caregiver stress: the estimated effect on the Caregiver Stress Index was small and statistically insignificant (0.03 SD, SE = 0.05). This indicates that the program fostered new developmental activities without overburdening families or creating negative spillovers for well-being.

Disaggregating results by treatment arm in Panels B and C highlights important differences. The training-only arm generated the largest gains in child development (0.20 SD, $p < 0.05$), alongside modest improvements in parental engagement (0.11 SD, $p < 0.10$), with no evidence of increased stress. This magnitude approaches those found in more intensive urban preschool models; for example, the Boston Pre-K program achieved larger impacts of 0.45 to 0.62 SD through comprehensive curricula and coaching (Weiland and Yoshikawa, 2013), but our findings demonstrate that meaningful gains are attainable even in resource-constrained rural settings. Adding in-class helpers also produced positive outcomes: children improved by 0.15 SD ($p < 0.10$), and caregiver engagement rose by 0.16 SD ($p < 0.01$). By reducing teacher workload, helpers appear to have enabled teachers to sustain instructional quality while maintaining active connections with parents. In contrast, the training-plus-facilitator arm produced weaker effects on child development (0.04 SD, not significant), though it did modestly improve parental engagement (0.11 SD, $p < 0.10$) and was the only arm associated with reduced caregiver stress (–0.11 SD, $p < 0.10$), perhaps because facilitators absorbed more of the outreach burden.

Overall, these results underscore the importance of both workload constraints and complementarities in early childhood service delivery. Even relatively small early childhood impacts can be highly consequential: meta-analytic evidence shows that ECE participation is associated with lasting benefits, including reductions in special education placement (d = 0.33 SD), grade retention (d = 0.26 SD), and increases in high school completion (d = 0.24 SD) (McCoy et al., 2017).[15] Interventions that ease administrative burdens while keeping teachers central to both instruction and parent communication appear to generate the most consistent benefits. By contrast, models that separate classroom teaching from parental engagement may reduce stress but fail to deliver meaningful developmental gains. The marginally significant difference between helper and facilitator arms on stress ($p = 0.05$) further suggests that externally driven parent engagement, when detached from classroom dynamics, reshapes how families experience these interactions. Our findings contribute to a grow-

[15] Here d refers to Cohen's standardized mean difference effect size, calculated as the difference in means between treatment and control groups divided by the pooled standard deviation. Expressing impacts in this way allows for comparability across studies and outcome measures.

ing body of evidence—from India (Ganimian et al., 2024), Colombia (Andrew et al., 2024), and beyond—highlighting how the design of teacher support structures critically shapes the effectiveness and scalability of early childhood interventions.

6.4 Impacts on Caregiver Attitudes Toward Disability

We also examine whether the intervention influenced caregivers' beliefs about discipline and attitudes toward disability, outcomes linked to the three parent education sessions on disability awareness, identification strategies, and inclusive approaches. These sessions were delivered through interactive methods such as storytelling and group discussion. The emphasis on disability inclusion is particularly important in low-resource settings where children with developmental delays often face barriers to participation and where caregiver attitudes shape developmental opportunities.

Results in Table 4 show modest effects. The intervention did not change caregiver views on physical discipline (0.00 SD, not significant), consistent with evidence that disciplinary norms are difficult to shift without more intensive engagement (Gershoff et al., 2016; Knerr et al., 2013). By contrast, we find a small improvement in caregiver attitudes toward disability (0.09 SD, $p < 0.10$). This index captures inclusive views regarding integration of children with disabilities, school accommodations, and equal opportunities. Caregivers also report higher confidence in supporting children with disabilities (0.08 SD), though this effect is not statistically significant. These results are consistent with evidence that parenting interventions often yield modest shifts in beliefs, particularly in domains aligned with community values (Gómez-Cotilla et al., 2024; Yousafzai et al., 2014).

Comparing the effects across treatment arms in Panels B and C reveals heterogeneity that is policy relevant. The training-only arm shows little impact, while the training plus helper arm generates the strongest effects, improving both attitudes toward disability (0.14 SD, $p < 0.05$) and confidence in supporting children with disabilities (0.13 SD, $p < 0.10$). The training plus facilitator arm produces smaller and non-significant changes. This pattern suggests that relieving teacher workload through in-class helpers increased the effectiveness of parent education components. Similar evidence from education and health programs shows that reducing frontline worker burdens improves service delivery and engagement (Duflo et al., 2015; Perry et al., 2014). Overall, while the intervention did not alter deep-rooted beliefs about discipline, it modestly improved caregiver attitudes toward disability inclusion, particularly when coupled with classroom support. These attitudinal shifts, though smaller than changes in parent–child interactions, represent complementary outcomes that may contribute to

more inclusive environments and sustained improvements in child development.

6.5 Heterogeneity in Program Impacts

We next examine whether program impacts varied across baseline caregiver characteristics. Table 5 present results stratified by caregiver stress and parental engagement (PESL). Among caregivers with below-median baseline engagement, the intervention generated substantial improvements in child development outcomes (0.22 SD increase in ASQ, $p < 0.01$), alongside modest and statistically insignificant changes in parental engagement (0.09 SD). In contrast, among caregivers with above-median baseline engagement, the program produced a 0.14 SD increase in PESL ($p < 0.05$), but only modest and statistically insignificant child development gains (0.04 SD). Table 6 presents heterogeneity in impacts across the baseline distribution of the main outcomes. Although estimates are imprecise, all treatments appear to have larger effects on the ASQ index among children in the lowest quartile of its baseline distribution. In contrast, the largest effects on the PESL index are observed in the highest baseline quartile. Taken together, these results suggest that ASQ gains are concentrated among children with the most room to improve, whereas socio-emotional development benefits accrue primarily to those with higher initial levels.

Figure 2 presents heterogeneity in program impacts by child and household characteristics. Children from above-median–asset households show stronger gains in ASQ and PESL relative to those from poorer households, while stress outcomes remain similar across groups. Boys and girls benefit to a similar degree, indicating that impacts do not vary by student gender. More variation emerges with caregiver education: children of less-educated caregivers show larger improvements, particularly in ASQ and PESL, while effects for children of more educated caregivers are limited. By caregiver gender, program impacts are broadly comparable across groups. Differences by family composition are also notable. Children from households with more adults show somewhat larger improvements than those in smaller households, while children with more siblings display consistently higher gains across all outcomes. Taken together, these patterns suggest that the intervention's effects are widely shared but are amplified in households with greater sibling presence and, to some extent, more adult support, while caregiver education shapes the degree of developmental gains observed.

Overall, the heterogeneity analyses suggest that the intervention was not only effective on average but also disproportionately benefited stressed, less-engaged, and less-educated households—groups most at risk of falling behind in the early years—thereby contributing to a narrowing of developmental

disparities.

6.6 Exploring Potential Mechanisms

To understand how the intervention may have generated these impacts, we consider both the heterogeneity patterns and additional descriptive evidence. One mechanism is compensatory: for households with lower initial engagement, the program offset deficits in the home environment by improving classroom quality and reducing caregiver stress, leading to significant child development gains. Another is reinforcement: for households with higher initial engagement, the program primarily strengthened practices already in place, improving parental engagement but yielding smaller incremental developmental returns. These contrasting pathways highlight that the same intervention can operate through different channels depending on baseline family characteristics.

We also examine direct indicators of program implementation. Table 7 shows that schools with a classroom helper recorded higher parental attendance at the outset than training-only schools, averaging about one extra parent per session. This advantage persisted throughout the program, even as attendance declined across all arms. By contrast, schools assigned a facilitator showed no meaningful difference from training-only schools in either average attendance or consistency. These patterns suggest that helpers, by easing teacher workload inside classrooms, allowed teachers to mobilize parents more effectively, whereas facilitators did not provide the same advantage. Once parents began attending, however, participation regularity was similar across arms, pointing to initial recruitment rather than retention as the key difference.

Finally, we explore how home and school environments interacted. Table 8 indicates that in control schools, parental engagement and classroom quality acted as substitutes: children seemed to benefit from one or the other, but not both at the same time. In treated schools, this changed. The strongest improvements in child development outcomes were observed when higher parental engagement coincided with improved classroom conditions, suggesting that the intervention helped turn these inputs from substitutes to complements. For parental practices, baseline engagement remained the strongest predictor of endline outcomes regardless of classroom improvements, while reductions in caregiver stress were most pronounced among families with initially low engagement. Taken together, these findings suggest that the program worked not by shifting any one domain alone, but by creating opportunities for parents and teachers to reinforce each other's contributions to child development.

6.7 Attrition and Compliance

As discussed in Section 4.7.3, 127 children included in the baseline assessment did not participate in the endline survey, yielding an attrition rate of 5% in the analysis sample. While modest, attrition can compromise internal validity if it differs systematically between treatment and control groups. Upward bias in treatment effects would occur if children with weaker baseline attributes disproportionately exited treatment groups, or if children with stronger baseline attributes disproportionately exited the control group. Although downward bias is possible, upward bias is typically the more serious concern. We therefore begin by examining whether attrition rates differ across experimental groups. Panel A of Table A3 reports OLS regressions of an attrition indicator on treatment assignment. Attrition rates in Training Only and Training + Classroom Help schools are higher than in control schools, but these differences are not statistically significant (p-values 0.20 and 0.25). We then test whether attrition is systematically related to baseline characteristics. Panel B shows that attritors had slightly lower ASQ, PESL, and stress index scores at baseline, though these differences are not statistically significant. Other covariates reveal systematic patterns: attritors came from households with fewer assets, while female children were less likely to attrit. These results are consistent with prior evidence that attrition tends to be concentrated among socioeconomically disadvantaged groups (Fitzgerald et al., 1998).

To examine the implications for estimated impacts, we apply Lee bounds (Lee, 2009). As shown in Table A4, ASQ treatment effects lie between 0.066 and 0.229 standard deviations, with the lower bound remaining positive, which indicates that the main results are not driven by selective attrition. For the PESL index, bounds range from –0.116 to 0.121, but descriptive evidence shows that attritors were clustered near the median of the baseline distribution rather than at the lower tail, suggesting limited potential for bias. Combined with the modest overall attrition rate, these findings imply that upward bias is unlikely to compromise internal validity. Finally, we examine program implementation and note that 20 of the 150 treatment schools did not conduct PE sessions (6 in Training Only, 9 in Training + Helper, and 5 in Training + Facilitator). Table A5 compares baseline characteristics of students in compliant and non-compliant schools, showing that children in non-compliant schools tended to live in larger households, were less likely to have female caregivers, and had caregivers with lower average education. However, baseline ASQ, PESL, and stress outcomes, did not differ significantly between the two groups.

7 Benchmarking Program Impacts and Costs

In this section, we discuss the magnitude of treatment effects observed in our study and compare them to the broader literature. We find effect sizes ranging from 0.13–0.20 SD on the Ages and Stages Questionnaire (ASQ) and 0.11–0.20 SD on the Practices of Early Stimulation and Learning (PESL) index, which are similar to those reported in the broader empirical literature on early childhood education (ECE) programs (see Table 9). These magnitudes are similar to pooled estimates from meta-analyses in low- and middle-income countries (LMICs), which report gains of about +0.15 SD in cognition and +0.12 SD in socio-emotional development (Holla et al., 2021). Our estimates also parallel the teacher professional development package in Colombia's "Hogares Infantiles Mejorados," which raised child development scores by +0.16 SD on average and by +0.30 SD among the poorest households (Andrew et al., 2024). Comparable effects were documented for Rwanda's "First Steps" parenting program (+0.30–0.38 SD on ASQ indices; Justino et al. 2023) and for India's urban home-visiting intervention (+0.30 SD on Bayley-III developmental assessments; Andrew et al. 2020).

However, our effect sizes are smaller than those estimated in resource-intensive scholarship or subsidy schemes. India's kindergarten subsidy program produced gains of +0.80 SD by the end of kindergarten (Dean and Jayachandran, 2020), and Tamil Nadu's Integrated Child Development Services (ICDS) reform delivered improvements of 0.29–0.46 SD in language and mathematics (Ganimian et al., 2024). Still, the estimates from this study are larger than the null impacts of The Gambia's expansion and quality enhancement trial (Blimpo et al., 2022) and the modest +0.13 SD gains from Honduras' conditional cash transfer program (López Bóo and Creamer, 2018). Put together, these comparisons place our study in the mid-range of program impacts: more effective than transfer or access-only models, yet below the levels observed in intensive center-based or scholarship interventions. Overall, the effect sizes estimated in this study are most comparable to scalable, cost-effective designs that leverage teacher training alongside structured parental engagement.

Evidence on program costs from other large-scale interventions provides useful benchmarks for interpreting these magnitudes. Tamil Nadu's ICDS facilitator program achieved a benefit–cost ratio (BCR) of roughly 13:1 (Ganimian et al., 2024). In Colombia, the combined "Hogares Infantiles Mejorado" and "Fundación Éxito" package cost only $35 upfront and $13 annually per child, yet maintained positive impacts (Andrew et al., 2024). Rwanda's "First Steps" achieved +0.30–0.38 SD improvements at a delivery cost of $2 per caregiver session, making it one of the most efficient programs documented (Justino et al., 2023). In contrast, Honduras' cash transfer cost nearly $500 per household per year but

yielded just +0.13 SD in ASQ scores (López Bóo and Creamer, 2019), and the teaching-assistant variant of Colombia's Hogares Infantiles cost $300 per child with no measurable effects. Large-scale reforms show further variation: Ghana's preschool quality package produced +0.11–0.18 SD with BCRs of 11–103:1 (Wolf et al., 2019); Peru's pedagogy reform +0.19 SD with BCRs of 29–88 (Gallego et al., 2021); Indonesia's ECE expansion +0.16 SD socio-emotional (Brinkman et al., 2017); and Bangladesh's preschool initiative +0.25–0.37 SD with BCRs of 3–28 (Spier et al., 2020).

Our intervention in Nepal compares favorably in this context (see Table 10). The implementation across 150 ECD centers costs about USD 47,500 (≈ NPR 6 million) in total, equivalent to USD 317 (≈ NPR 40,000) per center or about USD 21 (≈ NPR 2,600) per child. These costs covered the full set of activities, including twenty-session parenting education, remuneration for 50 facilitators and 50 caregivers, coaching and mentoring, and monitoring and supervision. Following Ganimian et al. (2024), the effect sizes we observe (0.13–0.20 SD on ASQ; 0.11–0.20 SD on PESL) imply benefit–cost ratios in the range of 11–14 under conservative assumptions. Even modest tax recovery—on the order of 8 percent of projected lifetime earnings gains—would be sufficient to fully offset the program's delivery costs. Our intervention aligns with other scalable, cost-effective ECD interventions that combine moderate delivery costs with meaningful gains in child development.

8 Conclusion

This paper provides experimental evidence on how the organization of teacher training and support structures shapes the effectiveness of early childhood programs delivered through government systems. The intervention we evaluate in Nepal demonstrates that even relatively modest reforms, when embedded within the state's existing service-delivery infrastructure, can lead to measurable improvements in both children's developmental outcomes and caregiver practices. Importantly, the variation across treatment arms reveals that it is not only the content of early childhood interventions that matters, but also the way in which they are implemented and integrated into frontline systems. Our findings show that relieving teachers of certain workload pressures while keeping them central to both classroom instruction and parental engagement proved more effective than models that delegated responsibility to external actors. This underscores the importance of program design in contexts where frontline workers face competing demands and multiple institutional constraints (Duflo et al., 2015; Bold et al., 2018). The broader lesson is that scaling up interventions through government systems requires careful attention to the organizational realities faced by service providers, rather than assuming

that program content alone will drive outcomes.

These findings contribute to a wider literature on human capital formation and service delivery in low- and middle-income countries. A recurring theme in this body of work is that rapid expansions in access to schooling, healthcare, or social protection often fail to generate commensurate improvements in outcomes when quality considerations are neglected (Pritchett, 2013; Glewwe and Kremer, 2006). Our results reinforce this concern: scaling early childhood programs without addressing staffing levels, workload management, and the complementarities between schools and households is unlikely to yield meaningful or lasting developmental gains. More broadly, the evidence suggests that frontline capacity and the organization of support within public systems are central determinants of program effectiveness (Mbiti et al., 2019). By showing that home and school environments—often functioning as substitutes in resource-constrained settings—can be transformed into complements through well-designed interventions, this study highlights a mechanism that may be relevant across other sectors of human development where household investments interact with the performance of public service providers (Heckman and Karapakula, 2019; Pianta et al., 2008). This framing also connects to the economics of human development more generally, which emphasizes the cumulative and interactive nature of investments made in children over time.

For policymakers, the results illustrate both promising opportunities and important cautions. On one hand, our findings highlight the potential of relatively low-cost teacher training models which, when combined with appropriate workload relief, are capable of shifting classroom practices and encouraging more supportive parental engagement. Such approaches align well with government priorities in countries like Nepal, where rapid expansion in access to early childhood programs has frequently outpaced parallel improvements in quality (Andrew et al., 2024). Beyond their direct impacts on children and caregivers, these models are attractive because they can be implemented using existing public-sector infrastructure, requiring only modest additional resources. This makes them particularly relevant for low-income settings where fiscal space is limited but the demand for early learning opportunities is rapidly rising. On the other hand, our evidence cautions against organizational models that outsource parental engagement to facilitators disconnected from daily classroom practices. While such specialization may appear efficient in theory, in practice it risks undermining complementarities between home and school environments, thereby limiting the potential benefits to children (Fryer Jr., 2018). The contrast across treatment arms therefore suggests that the organization of roles and responsibilities within government systems is as important as the curriculum or pedagogy itself. For policymakers, the central lesson is that strengthening state capacity in early

childhood requires not only increasing the number of personnel but also embedding them effectively within existing structures of accountability and support (Ganimian et al., 2024). When designed with these principles in mind, early childhood programs can deliver meaningful gains in developmental outcomes at relatively low cost while remaining scalable within government systems.

While our study documents meaningful short-run gains, several questions remain open for future research. The follow-up period is necessarily limited, and future work should examine whether these improvements persist into primary school and beyond. Our outcome measures rely on caregiver reports, which are widely validated but could be complemented with direct assessments in subsequent studies (Araujo et al., 2019). The program was implemented at scale across many schools in one district, offering strong evidence of feasibility in real-world conditions. A natural next step is to test whether similar results emerge in other regions and institutional settings. Longer-term follow-up and replication will be essential for understanding whether the short-run gains we observe translate into lasting improvements in schooling trajectories, labor market outcomes, and intergenerational mobility (Elango et al., 2015; Garcıa et al., 2023).

Taken together, our findings underscore that improving early childhood outcomes at scale requires attention not only to pedagogy and curriculum but also to the institutional choices that govern delivery. By embedding reforms within government systems, targeting both teachers and parents, and addressing structural workload constraints, policymakers can design interventions that are both effective and scalable. More broadly, this study contributes to a growing body of research demonstrating that human capital policies must grapple with the realities of implementation and the limits of state capacity (Heckman, 2006; List et al., 2021). As investments in early childhood expand worldwide, lessons on delivery design, institutional integration, and the fostering of complementarities between households and frontline providers may prove just as important as the content of the interventions themselves. We hope that these results will inform not only the design of future programs but also the broader research agenda on how to achieve lasting improvements in human capital at scale.

References

Alan, S. (2025): "Shaping Society's Character: The Role of Schools in Developing Social and Emotional Skills," in *Handbook of Culture*, ed. by B. Enke, P. Giuliano, N. Nunn, and L. Wantchekon, Elsevier, forthcoming.

Andrew, A., O. Attanasio, B. Augsburg, M. Day, S. Grantham-McGregor, C. Meghir, F. Mehrin, S. Pahwa, and M. Rubio-Codina (2020): "Effects of a scalable home-visiting intervention on child development in slums of urban India: evidence from a randomised controlled trial," *Journal of child psychology and psychiatry*, 61, 644–652.

Andrew, A., O. P. Attanasio, R. Bernal, L. C. Sosa, S. Krutikova, and M. Rubio-Codina (2024): "Preschool quality and child development," *Journal of Political Economy*, 132, 2304–2345.

Araujo, M. C., P. Carneiro, Y. Cruz-Aguayo, and N. Schady (2016): "Teacher Quality and Learning Outcomes in Kindergarten," *The Quarterly Journal of Economics*, 131, 1415–1453.

Araujo, M. C., M. Dormal, and N. Schady (2019): "Childcare quality and child development," *Journal of Human Resources*, 54, 656–682.

Attanasio, O., S. Cattan, E. Fitzsimons, C. Meghir, and M. Rubio-Codina (2020): "Estimating the Production Function for Human Capital: Results from a Randomized Controlled Trial in Colombia," *American Economic Review*, 110, 48–85.

Banerjee, A., E. Duflo, A. Finkelstein, L. F. Katz, B. A. Olken, and A. Sautmann (2020): "In praise of moderation: Suggestions for the scope and use of pre-analysis plans for rcts in economics," Tech. rep., National Bureau of Economic Research.

Banerjee, A. V., S. Cole, E. Duflo, and L. Linden (2007): "Remedying Education: Evidence from Two Randomized Experiments in India," *The Quarterly Journal of Economics*, 122, 1235–1264.

Bayley, N. (2006): "Bayley scales of infant and toddler development," .

Benjamini, Y. and Y. Hochberg (1995): "Controlling for False Discovery Rate: A Practical and Powerful Approach to Multiple Testing," *Journal of Royal Statistical Society, Series B* (*Methodological*), 57(1), 289–300.

Black, M., S. Walker, L. Fernald, C. Andersen, A. DiGirolamo, C. Lu, D. Mccoy, G. Fink, Y. Shawar, J. Shiffman, A. Devercelli, Q. Wodon, E. Vargas-Baron, and S. Grantham-Mcgregor (2016): "Early childhood development coming of age: Science through the life course," *The Lancet*, 389.

Black, M. M., S. P. Walker, L. C. H. Fernald, C. T. Andersen, A. M. DiGirolamo, C. Lu, D. C. McCoy, G. Fink, Y. R. Shawar, J. Shiffman, A. E. Devercelli, Q. T. Wodon, E. Vargas-Baron, and S. Grantham-McGregor (2017): "Early Childhood Development Coming of Age: Science Through the Life Course," *The Lancet*, 389, 77–90.

Blimpo, M. P., P. Carneiro, P. Jervis, and T. Pugatch (2022): "Improving access and quality in early childhood development programs: Experimental evidence from the Gambia," *Economic Development and Cultural Change*, 70, 1479–1529.

Bold, T., M. S. Kimenyi, G. Mwabu, A. Ng'ang'a, and J. Sandefur (2018): "Experimental evidence on scaling up education reforms in Kenya," *Journal of Public Economics*, 168, 1–20.

Bos, J. M., A. S. Shonchoy, S. Ravindran, and A. Khan (2024): "Early childhood human capital formation at scale," *Journal of Public Economics*, 231, 105046.

Brinkman, S. A., A. Hasan, H. Jung, A. Kinnell, and M. Pradhan (2017): "The impact of expanding access to early childhood education services in rural Indonesia," *Journal of Labor Economics*, 35, S305–S335.

Brutti, Z. and D. Montolio (2021): "Preventing criminal minds: Early education access and adult offending behavior," *Journal of Economic Behavior Organization*, 191, 97–126.

Campbell, F., G. Conti, J. Heckman, S. Moon, R. Pinto, E. Pungello, and Y. Pan (2014): "Early Childhood Investments Substantially Boost Adult Health," *Science (New York, N.Y.)*, 343, 1478–85.

Chen, S. and S. Wolf (2021): "Measuring the Quality of Early Childhood Education in Low- and Middle-Income Countries," *Frontiers in Psychology*, 12, 774740.

Coffey, D., M. Geruso, and D. Spears (2017): "Cognitive science in the field: A preschool intervention durably enhances intuitive but not formal mathematics," *Psychology*.

Cook, J. B. and R. K. Mansfield (2016): "Task-specific experience and task-specific talent: Decomposing the productivity of high school teachers," *Journal of Public Economics*, 140, 51–72.

Dean, J. T. and S. Jayachandran (2020): "Attending kindergarten improves cognitive development in India, but all kindergartens are not equal," Tech. rep., mimeo.

Dee, T. S. and R. Cohodes, Sarah (2008): "Out-of-Field Teachers and Student Achievement: Evidence from Matched-Pairs Comparisons," *Public Finance Review*, 36, 7–32.

Duflo, A., J. Kiessel, and A. M. Lucas (2024): "Experimental evidence on four policies to increase learning at scale," *The Economic Journal*, 134, 1985–2008.

Duflo, E., P. Dupas, and M. Kremer (2015): "School governance, teacher incentives, and pupil–teacher ratios: Experimental evidence from Kenyan primary schools," *Journal of Public Economics*, 123, 92–110.

Elango, S., J. L. García, J. J. Heckman, and A. Hojman (2015): "Early childhood education," in *Economics of Means-Tested Transfer Programs in the United States, Volume 2*, University of Chicago Press, 235–297.

Fitzgerald, J. M., P. Gottschalk, and R. A. Moffitt (1998): "An Analysis of Sample Attrition in Panel Data: The Michigan Panel Study of Income Dynamics," *Journal of Human Resources*, 33, 251–299.

Fryer Jr., R. G. (2018): "The "Pupil" Factory: Specialization and the Production of Human Capital in Schools," *American Economic Review*, 108, 616–56.

Gallego, F. A., E. Näslund-Hadley, and M. Alfonso (2021): "Changing pedagogy to improve skills in preschools: experimental evidence from Peru," *The World Bank Economic Review*, 35, 261–286.

Ganimian, A. J., K. Muralidharan, and C. R. Walters (2024): "Augmenting State Capacity for Child Development: Experimental Evidence from India," *Journal of Political Economy*, 132, 1565–1602.

Garcia, J. L., J. J. Heckman, and V. Ronda (2023): "The lasting effects of early childhood education on promoting the skills and social mobility of disadvantaged African Americans and their children," *Journal of Political Economy*, 131, 1477–1506.

Gershoff, E. T., A. Grogan-Kaylor, J. E. Lansford, L. Chang, A. Zelli, K. Deater-Deckard, and K. A. Dodge (2016): "Parent discipline practices in an international sample: Associations with child behaviors and moderation by perceived normativeness," *Child Development*, 87, 487–502.

Gertler, P., J. Heckman, R. Pinto, A. Zanolini, C. Vermeersch, S. Walker, S. M. Chang, and S. Grantham-McGregor (2014): "Labor market returns to an early childhood stimulation intervention in Jamaica," *Science*, 344, 998–1001.

Glewwe, P., N. Ilias, and M. Kremer (2010): "Teacher Incentives," *American Economic Journal: Applied Economics*, 2, 205–27.

Glewwe, P. and M. Kremer (2006): "Schools, Teachers, and Education Outcomes in Developing Countries," in *Handbook of the Economics of Education*, ed. by E. A. Hanushek and F. Welch, Elsevier, vol. 2, 945–1017.

Gómez-Cotilla, R., M. d. l. Á. López-de Uralde-Selva, and L. Valero-Aguayo (2024): "Efficacy of Early Intervention Programmes: Systematic Review and Meta-analysis," *Psicología Educativa*, 30, 1–10.

Government of Nepal (2016): "Nepal School Sector Development Plan 2016–2023," Accessed: 2025-01-20.

Grantham-McGregor, S., Y. B. Cheung, S. Cueto, P. Glewwe, L. Richter, and B. Strupp (2007): "Developmental Potential in the First 5 Years for Children in Developing Countries." *The Lancet*, 369, 60–70.

Heckman, J. J. (2006): "Skill formation and the economics of investing in disadvantaged children," *Science*, 312, 1900–1902.

Heckman, J. J. and G. Karapakula (2019): "Intergenerational and Intragenerational Externalities of the Perry Preschool Project," Working Paper 25889, National Bureau of Economic Research.

Holla, A., M. Bendini, L. Dinarte, and I. Trako (2021): "Is investment in preprimary education too low," *World Bank Policy Research Working Paper*.

Jakiela, P., O. Ozier, L. C. Fernald, and H. A. Knauer (2024): "Preprimary education and early childhood development: Evidence from government schools in rural Kenya," *Journal of Development Economics*, 171, 103337.

Jeong, J., E. E. Franchett, C. V. Ramos de Oliveira, K. Rehmani, and A. K. Yousafzai (2021): "Parenting interventions to promote early child development in the first three years of life: A global systematic review and meta-analysis," *PLOS Medicine*, 18, 1–51.

Justino, P., M. Leone, P. Rolla, M. Abimpaye, C. Dusabe, M. D. Uwamahoro, and R. Germond (2023): "Improving parenting practices for early child development: Experimental evidence from Rwanda," *Journal of the European Economic Association*, 21, 1510–1550.

Knerr, W., F. Gardner, and L. Cluver (2013): "Improving positive parenting skills and reducing harsh and abusive parenting in low-and middle-income countries: A systematic review," *Prevention Science*, 14, 352–363.

Kraft, M. A. (2020): "Interpreting Effect Sizes of Education Interventions," *Educational Researcher*, 49, 241–253.

Kraft, M. A., D. Blazar, and D. Hogan (2018): "The effect of teacher coaching on instruction and achievement: A meta-analysis of the causal evidence," *Review of Educational Research*, 88, 547–588.

Kremer, M., N. Chaudhury, F. H. Rogers, K. Muralidharan, and J. Hammer (2005): "Teacher absence in India: A snapshot," *Journal of the European Economic Association*, 3, 658–667.

Lee, D. S. (2009): "Training, Wages, and Sample Selection: Estimating Sharp Bounds on Treatment Effects," *Review of Economic Studies*, 76, 1071–1102.

List, J. A., D. Suskind, and L. H. Supplee (2021): "The scale-up effect in early childhood and public policy," *The Scale-Up Effect in Early Childhood and Public Policy: Why Interventions Lose Impact at Scale and What We Can Do About It Routledge*.

López Bóo, F. and J. Creamer (2018): "Cash, conditions and child development: experimental evidence from a cash transfer in Honduras," Tech. rep., IDB Working Paper Series.

——— (2019): "Cash, conditions and child development: Experimental evidence from a cash transfer in honduras," Tech. rep., IZA Discussion Papers.

Lopez Garcia, I., U. Saya, and J. Luoto (2021): "Cost-effectiveness and economic returns of group-based parenting interventions to promote early childhood development: Results from a randomized controlled trial in rural Kenya," *PLOS Medicine*, 18, e1003746.

Macmillan, L. and E. Tominey (2022): "Parental inputs and socio-economic gaps in early child development," *Journal of Population Economics*, 36.

Magnuson, K. and G. J. Duncan (2016): "Can Early Childhood Interventions Decrease Inequality of Economic Opportunity?" *RSF: The Russell Sage Foundation Journal of the Social Sciences*, 2, 123–141.

Masino, S. and M. Niño-Zarazúa (2016): "What works to improve the quality of student learning in developing countries?" *International Journal of Educational Development*, 48, 53–65, aid, Education Policy, and Development.

Mbiti, I., K. Muralidharan, M. Romero, Y. Schipper, C. Manda, and R. Rajani (2019): "Inputs, Incentives, and Complementarities in Education: Experimental Evidence from Tanzania," *The Quarterly Journal of Economics*, 134, 1627–1673.

McCoy, D. C., H. Yoshikawa, K. M. Ziol-Guest, G. J. Duncan, H. S. Schindler, K. Magnuson, R. Yang, A. Koepp, and J. P. Shonkoff (2017): "Impacts of Early Childhood Education on Medium- and Long-Term Educational Outcomes," *Educational Researcher*, 46, 474–487.

McKenzie, D. (2012): "Beyond Baseline and Follow-up: The Case for More T in Experiments," *Journal of Development Economics*, 99, 210–221.

Muralidharan, K., J. Das, A. Holla, and A. Mohpal (2017): "The Fiscal Cost of Weak Governance: Evidence from Teacher Absence in India," *Journal of Public Economics*, 145, 116–135.

Muralidharan, K. and Sundararaman (2013): "Contract Teachers: Experimental Evidence from India," *NBER WP Series, Working Paper 19440*.

Perry, H. B., R. Zulliger, and M. M. Rogers (2014): "Community health workers in low-, middle-, and high-income countries: an overview of their history, recent evolution, and current effectiveness," *Annual Review of Public Health*, 35, 399–421.

Phillips, D. A. and J. P. Shonkoff (2000): "From neurons to neighborhoods: The science of early childhood development," .

Pianta, R. C., K. M. La Paro, and B. K. Hamre (2008): *Classroom Assessment Scoring System (CLASS) Manual, Pre-K*, Baltimore, MD: Paul H. Brookes Publishing Co.

Poudyal, N., M. Banskota, and D. Khadka (2019): "Disability in Nepal," Report, UNICEF.

Poyck, e. a. (2016): "Independent Joint Evaluation of SSRP," Accessed: 2025-01-20.

Pritchett, L. (2013): *The Rebirth of Education: Schooling Ain't Learning*, Washington, DC: CGD Books.

Rubio-Codina, M., O. Attanasio, C. Meghir, N. Varela, and S. Grantham-McGregor (2015): "The socioeconomic gradient of child development: Cross-sectional evidence from children 6–42 months in Bogota," *Journal of Human Resources*, 50, 464–483.

Spier, E., K. Kamto, A. Molotsky, A. Rahman, N. Hossain, Z. Nahar, and H. Khondker (2020): "Bangladesh early years preschool program impact evaluation," *World Bank, Washington, DC*.

UNICEF (2017): "A Study of Knowledge, Attitude, and Practice Before And After Implementation of Parental Education Programme in 3 Districts of Nepal," .

Walker, S., S. Chang, M. Vera-Hernández, and S. Grantham-Mcgregor (2011): "Early Childhood Stimulation Benefits Adult Competence and Reduces Violent Behavior," *Pediatrics*, 127, 849–57.

Walker, S. P., T. D. Wachs, J. M. Gardner, B. Lozoff, G. A. Wasserman, E. Pollitt, J. A. Carter, and the International Child Development Steering Group (2007): "Child Development: Risk Factors for Adverse Outcomes in Developing Countries." *The Lancet*, 369, 147–57.

Weiland, C. and H. Yoshikawa (2013): "Impacts of a Prekindergarten Program on Children's Mathematics, Language, Literacy, Executive Function, and Emotional Skills," *Child Development*, 84, 2112–2130.

Wolf, S., J. L. Aber, J. R. Behrman, and E. Tsinigo (2019): "Experimental impacts of the Quality Preschool for Ghana interventions on teacher professional well-being, classroom quality, and children's school readiness," *Journal of Research on Educational Effectiveness*, 12, 10–37.

World Bank (2020): "Nepal Early Childhood Education Diagnostic," Tech. rep., Washington, D.C.

Yousafzai, A. K., M. A. Rasheed, A. Rizvi, R. Armstrong, and Z. A. Bhutta (2014): "Effect of integrated responsive stimulation and nutrition interventions in the Lady Health Worker programme in Pakistan on child development, growth, and health outcomes: a cluster-randomised factorial effectiveness trial," *The Lancet*, 384, 1282–1293.

Tables

Table 1: Effect on Classroom Facilities

	Classroom Facilities Index	Attendance Index
	(1)	(2)
Panel A: Pooled Treatment Arms		
Any Treatment	0.91***	0.23
	(0.18)	(0.18)
Observations	201	197
R^2	0.27	0.11
Panel B: Combining Training and Help		
Training Only	0.97***	0.56**
	(0.23)	(0.25)
Training + Any Help	0.87***	0.06
	(0.20)	(0.19)
Observations	201	197
R^2	0.27	0.13
Panel C: Individual Treatment Arms		
Training Only	0.97***	0.56**
	(0.23)	(0.26)
Training + Helper	1.14***	-0.02
	(0.24)	(0.22)
Training + Facilitator	0.60***	0.14
	(0.23)	(0.24)
Observations	201	197
R^2	0.29	0.14
Helper = Facilitator (p-value)	0.03	0.54

Notes: The sample comprises all schools that participated in the intervention; attendance data were not collected for four schools. The table presents results on classroom facilities and student attendance using regression equation (1). The outcome variable, Classroom Facilities Index, measures the physical quality of ECD classrooms using a checklist of 19 essential facilities and infrastructure. Each item was scored 1 if present and 0 if absent, and the total score was standardized relative to the control group to form the final index. The Attendance Index measures total attendance on the day of the classroom survey, standardized relative to the control group. All regressions include municipality fixed effects. *Any Treatment* is a dummy equal to one if a school received training only, training plus a classroom helper, or training plus an outside facilitator, and zero if in the control group. Standard errors are clustered at the school level and reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 2: Effects on Teacher–Student Interaction Quality

	Positive Interaction Index	Negative Interaction Index
	(1)	(2)
Panel A: Pooled Treatment Arms		
Any Treatment	0.49***	-0.57***
	(0.17)	(0.15)
Observations	3,004	3,004
R^2	0.15	0.20
Panel B: Combining Training and Help		
Training Only	0.55***	-0.59***
	(0.21)	(0.17)
Training + Any Help	0.46**	-0.56***
	(0.18)	(0.16)
Observations	3,004	3,004
R^2	0.15	0.20
Panel C: Individual Treatment Arms		
Training Only	0.55***	-0.59***
	(0.21)	(0.17)
Training + Helper	0.44**	-0.53***
	(0.19)	(0.18)
Training + Facilitator	0.48**	-0.58***
	(0.20)	(0.17)
Observations	3,004	3,004
R^2	0.15	0.20
Helper = Facilitator (p-value)	0.84	0.71

Notes: The table reports results on teacher–student interactions estimated from regression equation (1). The outcome variable, Positive (Negative) Interaction Index, measures the frequency of positive (negative) teacher–student interactions as the sum of components observed across 20 rounds. Positive interactions include reading to a group, teacher or student singing, circle-time activities, back-and-forth discussions, engaging in pretend play, calmly negotiating peer conflict, and smiling. Negative interactions capture negative discipline, yelling, talking with another adult, or being out of the classroom. A higher score reflects greater agreement. All regressions include municipality fixed effects. *Any Treatment* is a dummy equal to one if a school received training only, training plus a classroom helper, or training plus an outside facilitator, and zero otherwise. Standard errors are clustered at the school level and reported in parentheses. The data come from the Endline Survey, which includes all 3,004 student respondents. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 3: Treatment Effects on Child Development and Caregiver Outcomes

	ASQ Index	PESL Index	Caregiver Stress Index
	(1)	(2)	(3)
Panel A: Pooled Treatment Arms			
Any Treatment	0.15***	0.13**	0.03
	(0.05)	(0.05)	(0.05)
BH-Corrected P-Values	[0.04]	[0.04]	[0.64]
Observations	3,004	3,004	3,004
R^2	0.12	0.08	0.36
Panel B: Combining Training and Help			
Training Only	0.21***	0.11*	-0.01
	(0.06)	(0.06)	(0.06)
BH-Corrected P-Values	[0.00]	[0.13]	[0.86]
Training + Any Help	0.11**	0.13**	0.05
	(0.06)	(0.05)	(0.05)
BH-Corrected P-Values	[0.11]	[0.04]	[0.41]
Observations	3,004	3,004	3,004
R^2	0.12	0.08	0.36
Panel C: Individual Treatment Arms			
Training Only	0.21***	0.11*	-0.01
	(0.06)	(0.06)	(0.06)
BH-Corrected P-Values	[0.00]	[0.13]	[0.86]
Training + Helper	0.16**	0.16***	-0.01
	(0.07)	(0.06)	(0.06)
BH-Corrected P-Values	[0.04]	[0.04]	[0.86]
Training + Facilitator	0.08	0.11*	0.11*
	(0.06)	(0.06)	(0.06)
BH-Corrected P-Values	[0.27]	[0.13]	[0.12]
Observations	3,004	3,004	3,004
R^2	0.12	0.08	0.36
Helper = Facilitator (p-value)	0.18	0.44	0.05

Notes: The table presents results for the main outcomes estimated using regression equation (1). Each outcome variable is a standardized score relative to the control group for the aggregate Ages and Stages Questionnaire (ASQ), the Practice of Early Stimulation and Learning (PESL), and the Caregiver Stress Indexes. All regressions include municipality fixed effects. *Any Treatment* is a dummy equal to one if a school received training only, training plus a classroom helper, or training plus an outside facilitator, and zero if in the control group. The data come from the Endline Survey, which includes all 3,004 student respondents. Standard errors are clustered at the school level and reported in parentheses. P-values were also adjusted for multiple hypothesis testing using the False Discovery Rate (FDR) procedure Benjamini and Hochberg (1995). These adjusted p-values are reported in brackets under the standard errors. Raw p-values were first ranked in ascending order, then each was multiplied by the total number of hypotheses and divided by its rank. To ensure consistency, adjusted p-values were monotonically corrected by replacing each with the minimum of its own value and all larger-ranked values. The final adjusted p-values therefore increase weakly with rank and represent the standard Benjamini–Hochberg FDR correction. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 4: Effects on Caregiver Beliefs and Attitudes

	Attitude to Discipline	Attitude to Disability Index	Confidence Disability Index
	(1)	(2)	(3)
Panel A: Pooled Treatment Arms			
Any Treatment	0.00	0.09*	0.08
	(0.03)	(0.05)	(0.06)
Observations	3,004	3,004	3,003
R^2	0.06	0.10	0.09
Panel B: Combining Training and Help			
Training Only	-0.00	0.07	0.01
	(0.03)	(0.06)	(0.07)
Training + Any Help	0.00	0.10*	0.11*
	(0.03)	(0.05)	(0.06)
Observations	3,004	3,004	3,003
R^2	0.06	0.10	0.09
Panel C: Individual Treatment Arms			
Training Only	-0.00	0.07	0.01
	(0.03)	(0.06)	(0.07)
Training + Helper	-0.03	0.14**	0.13*
	(0.03)	(0.06)	(0.06)
Training + Facilitator	0.03	0.05	0.10
	(0.03)	(0.06)	(0.07)
Observations	3,004	3,004	3,003
R^2	0.06	0.11	0.09
Helper = Facilitator (p-value)	0.08	0.14	0.62

Notes: The table presents results on caregiver beliefs estimated using regression equation (1). The outcome variable *Attitude to Discipline* is a dummy equal to 1 if the parent does not consider it necessary or normal to spank a child for discipline. The outcome variable *Attitude to Disability Index* is a standardized index measuring caregiver attitudes toward disability, constructed as the additive sum of responses to whether the caregiver believes that children with disabilities should be separated from their parents, whether schools should accommodate children with disabilities, whether disabilities can be addressed, and whether children with disabilities deserve access to educational opportunities. The outcome variable *Confidence Disability Index* measures the caregiver's confidence in supporting children with disabilities, based on whether they believe they have the necessary knowledge and skills and whether they feel able to provide such support. All regressions include municipality fixed effects. The data come from the Endline Survey, covering all 3,004 student respondents. Standard errors are clustered at the school level and reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 5: Effect on Main Outcomes by Baseline PESL Scores

	Above Median PESL			Below Median PESL		
	ASQ Index	PESL Index	Caregiver Stress Index	ASQ Index	PESL Index	Caregiver Stress Index
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Pooled Treatment Arms						
Any Treatment	0.05	0.14**	-0.06	0.22***	0.09	0.12**
	(0.08)	(0.06)	(0.06)	(0.08)	(0.06)	(0.05)
Observations	1,506	1,506	1,506	1,497	1,497	1,497
R^2	0.10	0.08	0.37	0.16	0.11	0.37
Panel B: Combining Training and Help						
Training Only	0.12	0.15**	-0.14**	0.28***	0.10	0.11
	(0.09)	(0.07)	(0.06)	(0.09)	(0.07)	(0.06)
Training + Any Help	0.01	0.14**	-0.02	0.19**	0.08	0.13**
	(0.08)	(0.06)	(0.06)	(0.08)	(0.07)	(0.06)
Observations	1,506	1,506	1,506	1,497	1,497	1,497
R^2	0.10	0.08	0.37	0.16	0.11	0.37
Panel C: Individual Treatment Arms						
Training Only	0.12	0.15**	-0.14**	0.28***	0.10	0.11
	(0.09)	(0.07)	(0.06)	(0.09)	(0.07)	(0.06)
Training + Helper	0.06	0.20***	-0.09	0.24***	0.10	0.07
	(0.10)	(0.07)	(0.07)	(0.09)	(0.08)	(0.07)
Training + Facilitator	-0.03	0.08	0.03	0.13	0.05	0.20***
	(0.09)	(0.07)	(0.07)	(0.09)	(0.07)	(0.07)
Observations	1,506	1,506	1,506	1,497	1,497	1,497
R^2	0.10	0.09	0.37	0.16	0.11	0.37
Helper = Facilitator (p-value)	0.37	0.13	0.08	0.17	0.54	0.13

Notes: The table presents results for the main outcomes by subgroups defined according to baseline parental engagement levels. Each outcome variable is a standardized score relative to the control group for the aggregate Ages and Stages Questionnaire (ASQ), the Practice of Early Stimulation and Learning (PESL), and the Caregiver Stress Indexes. All regressions include municipality fixed effects. *Any Treatment* is a dummy equal to one if a school received training only, training plus a classroom helper, or training plus an outside facilitator, and zero if in the control group. Panel A reports results for children with above-median baseline PESL scores, while Panel B reports results for those with below-median scores. The data come from the Baseline and Endline Surveys, covering all students who participated in the endline survey except one child with missing baseline PESL, for a final sample of 3,003 respondents. Standard errors are clustered at the school level and reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 6: Heterogeneous Impacts by Baseline Outcome Levels

	Child Development and Caregiver Outcomes		
	ASQ Index	PESL Index	Stress Index
	(1)	(2)	(3)
Training Only	0.31***	0.03	-0.11
	(0.12)	(0.09)	(0.08)
Training + Helper	0.22*	0.02	-0.06
	(0.12)	(0.09)	(0.09)
Training + Facilitator	0.17	-0.03	0.02
	(0.12)	(0.09)	(0.08)
Training Only × Quartile 2	-0.15	0.11	0.14
	(0.12)	(0.10)	(0.10)
Training Only × Quartile 3	-0.23*	0.08	0.18*
	(0.13)	(0.14)	(0.11)
Training Only × Quartile 4	-0.11	0.39***	0.15
	(0.13)	(0.14)	(0.13)
Training + Helper × Quartile 2	-0.04	0.16	0.08
	(0.13)	(0.11)	(0.11)
Training + Helper × Quartile 3	-0.17	0.07	0.03
	(0.14)	(0.13)	(0.11)
Training + Helper × Quartile 4	-0.13	0.30**	0.11
	(0.14)	(0.15)	(0.12)
Training + Facilitator × Quartile 2	-0.05	0.17*	0.04
	(0.13)	(0.10)	(0.11)
Training + Facilitator × Quartile 3	-0.15	-0.05	0.14
	(0.14)	(0.14)	(0.11)
Training + Facilitator × Quartile 4	-0.05	0.24*	0.19
	(0.14)	(0.13)	(0.13)
Quartile 2	0.40***	0.35***	0.09
	(0.10)	(0.08)	(0.06)
Quartile 3	0.63***	0.82***	0.05
	(0.10)	(0.10)	(0.07)
Quartile 4	0.72***	0.75***	0.08
	(0.10)	(0.09)	(0.09)
F-test of interaction terms (p-value)	0.73	0.15	0.68
Observations	3,004	3,003	2,987
R^2	0.30	0.21	0.37

Notes: The table reports heterogeneous treatment effects of the intervention across quartiles of the baseline distribution of each outcome. Each column corresponds to an OLS regression of the endline outcome (*ASQ Index*, *PESL Index*, or *Caregiver Stress Index*) on treatment assignment, quartile indicators, and their interactions. All regressions include municipality fixed effects. The coefficients on the treatment indicators represent impacts for children in the first quartile of the baseline distribution, while the interaction terms capture differential impacts for children in higher quartiles. The F-test at the bottom reports whether the set of interaction terms jointly equals zero. The data come from the Endline Survey, covering all 3,004 student respondents. Standard errors are clustered at the school level and reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 7: Effects on Parent Education Session Attendance

	Attendance	Attendance Consistency
	(1)	(2)
Training + Helper	1.24*	-0.02
	(0.70)	(0.03)
Training + Facilitator	0.07	-0.02
	(0.72)	(0.02)
Session Number	-0.03*	0.00
	(0.01)	(0.00)
Observations	2,600	2,600
R^2	0.37	0.27

Notes: The table presents results on parent education session attendance. The outcome variable is the number of parents attending each session. All regressions include municipality fixed effects. Training only is the reference category. Training plus Helper equals one if a school was assigned to the training plus classroom helper arm, and zero otherwise. Training plus Facilitator equals one if a school was assigned to the training plus outside classroom helper (facilitator) arm, and zero otherwise. The data come from Parent Education Session Attendance Records, covering 130 treatment schools that implemented parent education sessions and for which attendance data were collected, totaling 2,600 session-level observations. Of the 150 treatment schools, 12 did not implement PE sessions (9 had not sent teachers for PE training, and 3 had facilitators who opted out), and attendance data were not collected for 8 additional schools. Standard errors are clustered at the school level and reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 8: Complementarity Effects Across Child and Caregiver Outcomes

	ASQ Index	PESL Index	Caregiver Stress Index
	(1)	(2)	(3)
Any Treatment	0.09	0.14*	0.14*
	(0.12)	(0.08)	(0.08)
High PESL	0.07	0.64***	0.07
	(0.06)	(0.07)	(0.06)
High Class	0.12	0.19	0.21
	(0.33)	(0.16)	(0.18)
Any Treatment × High PESL	-0.09	-0.04	-0.15*
	(0.09)	(0.10)	(0.08)
Any Treatment × High Class	0.08	-0.24	-0.23
	(0.33)	(0.16)	(0.18)
High PESL × High Class	-0.69***	-0.27	-0.13
	(0.22)	(0.25)	(0.17)
Any Treatment × High PESL × High Class	0.53**	0.36	0.09
	(0.23)	(0.27)	(0.18)
Observations	3,003	3,003	3,003
R^2	0.13	0.19	0.36

Notes: Each outcome variable is a standardized score relative to the control group for the aggregate Ages and Stages Questionnaire (ASQ), the Practice of Early Stimulation and Learning (PESL), and the Caregiver Stress Indexes. All regressions include municipality fixed effects. *Any Treatment* equals one if a school received training only, training plus a classroom helper, or training plus an outside facilitator, and zero otherwise. *High PESL* equals one if baseline PESL is above the median. *High Class* equals one if predicted classroom facilities improvement is above the median. Data sources: Baseline Survey, Classroom Facilities Check, and Endline Survey. The sample includes all students who participated in the endline survey except one child with missing baseline PESL ($N = 3{,}003$). Standard errors are clustered at the school level and reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 9: Benchmarking Program Impacts and Costs

Study	Country	Main Outcomes	Effect Size (SD)	Program Type/Cost-Effectiveness
A. Teacher Professional Development Center-Based Quality Reforms				
Nepal ECD (this study)	Nepal	Ages and Stages Questionnaire (ASQ); Practices of Early Stimulation and Learning (PESL)	+0.13–0.20 (ASQ); +0.11–0.20 (PESL)	Teacher training + parent engagement; modest cost; no formal benefit–cost ratio (BCR) yet
Andrew et al. (2024)	Colombia	Cognitive latent factor	+0.16 overall; +0.30 poorest	Teacher professional development (Hogares Infantiles); $35 upfront + $13 annually per child
Wolf et al. (2019)	Ghana	School readiness; teacher well-being	+0.11 (cognitive); +0.18 (socio-emotional)	Quality preschool reform; BCR 11–103:1
Gallego et al. (2021)	Peru	Cognitive test scores	+0.19	Pedagogical reform in preschools; BCR 29–88
Brinkman et al. (2017)	Indonesia	Socio-emotional skills	+0.16	ECE expansion in rural areas; cost-effective at scale
Spier et al. (2020)	Bangladesh	Cognitive and socio-emotional	+0.25 (cognitive); +0.37 (socio-emotional)	Preschool initiative; BCR 3–29
Coffey et al. (2017)	India	Field-based math tasks; socio-emotional	+0.09 (cognitive); +0.17 (socio-emotional)	Preschool/classroom enrichment; BCR 6–54
B. Parenting Groups/Home-Visiting				
Justino et al. (2023)	Rwanda	ASQ indices; parenting practices	+0.30–0.38 (ASQ); +0.47–0.62 (parent–child activities)	Parenting group model (First Steps); $2 per caregiver per session
Andrew et al. (2020)	India (urban)	Bayley-III developmental indices	+0.30 overall; +0.35 cognitive	Home-visiting program; $148 per child per year
C. Financial Access/Scholarship Subsidies				
Dean and Jayachandran (2020)	India	Cognitive composite; school attendance	+0.80 at end of kindergarten	Kindergarten scholarship subsidy; cost not reported
D. Cash Transfers				
López Bóo and Creamer (2018)	Honduras	ASQ (cognitive)	+0.13	Conditional cash transfer; $500 per household per year
E. State Capacity/System Reform				
Ganimian et al. (2024)	India (Tamil Nadu)	Math, language, executive function, nutrition	+0.29–0.46 (tests); +0.10–0.11 (nutrition, HH tests)	ICDS facilitator model; BCR 13:1–22:1
F. Access/Quality Expansion with Null Impacts				
Blimpo et al. (2022)	Gambia	Motor and language/hearing (MDAT)	Null	Expansion/quality trial; low cost, no impacts

Notes: ASQ = Ages and Stages Questionnaire. PESL = Practices of Early Stimulation and Learning. MDAT = Malawi Developmental Assessment Tool. ICDS = Integrated Child Development Services. BCR = Benefit–Cost Ratio. Effect sizes reported in standard deviations (SD). Costs expressed in 2020 US dollars where available.

Table 10: Program Costs and Unit Costs (Aug 2022–Feb 2023)

A. Cost Summary	
Remuneration	USD 2,508.79 [NPR 316,108]
Program costs	USD 41,539.68 [NPR 5,234,998]
Indirect costs (8%)	USD 3,523.88 [NPR 444,009]
Grand total	**USD 47,572.35** [**NPR 5,994,116**]
B. Unit costs	
Centers covered (number)	150
Cost per center	USD 317.15 [NPR 39,961]
Per-child cost[b] (12/15/20)	26.43/21.14/15.86 [NPR 3,330/2,664/1,998]

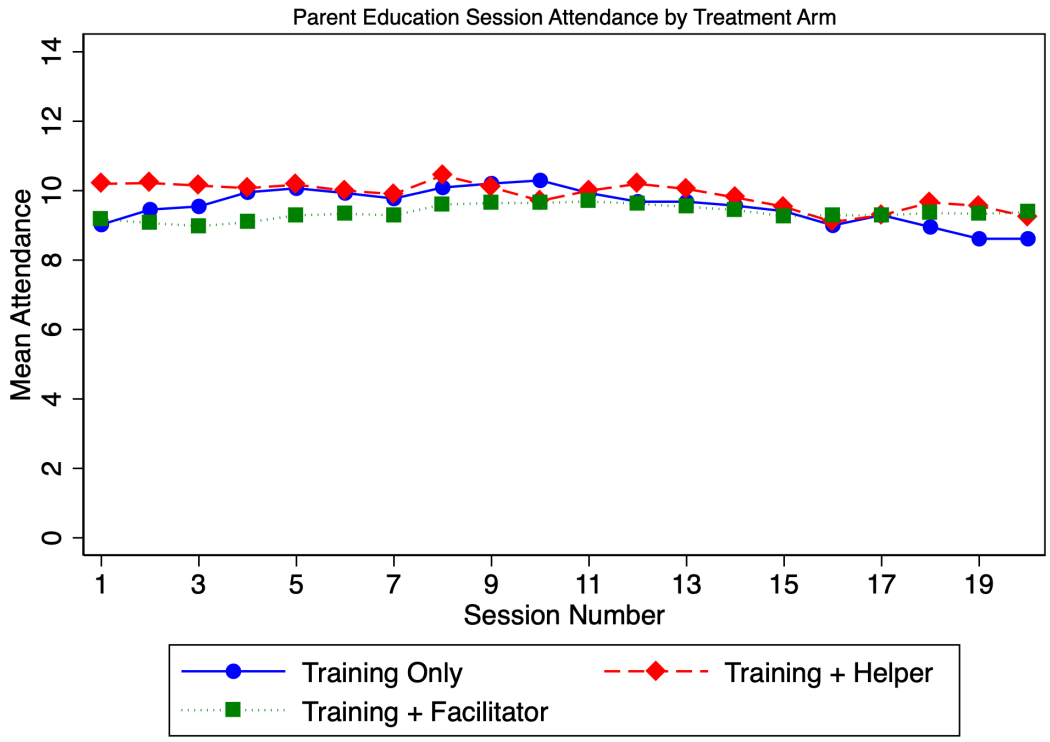
[a] Exchange rate: 1 USD = 126 NPR (financial proposal). NPR shown in brackets.

[b] Terms of Reference caps Parenting Education group size at 20 per center. Per-child cost = (total cost ÷ 150 centers) ÷ assumed enrollment.

Notes: Costs cover twenty-session Parenting Education, remuneration for 50 facilitators and 50 caregivers, coaching/mentoring, and monitoring/supervision.

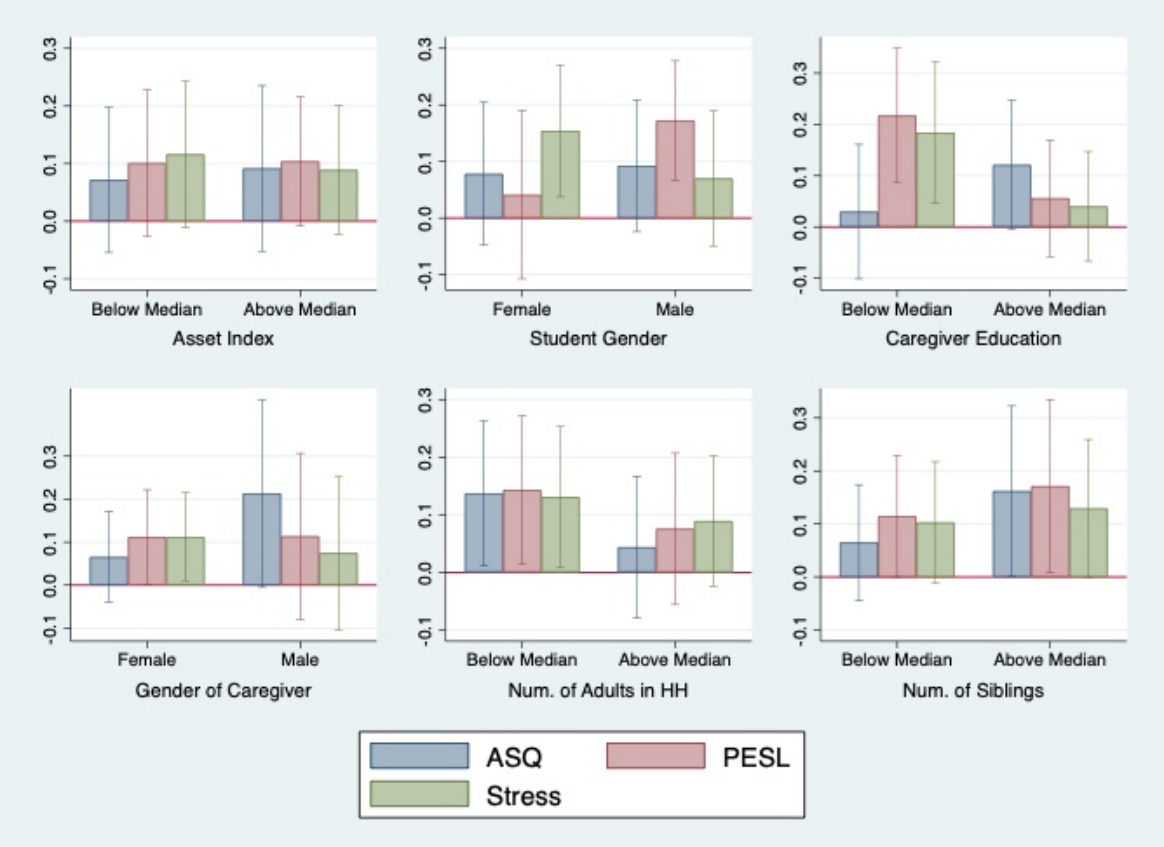
Figures

Figure 1: Parent Education Session Attendance by Treatment Arm



Notes: The figure shows the mean number of parents attending each parent education session by treatment arm. The sample includes 130 treatment schools that implemented parent education sessions and for which attendance data were collected. The horizontal axis represents the session number (1–20), and the vertical axis shows mean attendance. The blue line represents schools in the *Training Only* arm, the red line represents schools in the *Training + Helper* arm, and the green line represents schools in the *Training + Facilitator* arm. Out of 150 treatment schools, 12 schools did not implement parent education sessions (9 had not sent teachers for PE training, and 3 had facilitators who opted out), and attendance data were not collected for 8 additional schools. Source: Parent education session data.

Figure 2: Heterogeneity by Child and Household Characteristics



Notes: This figure shows heterogeneity in the impacts of the pooled treatments on the three main outcomes, disaggregated by key baseline child and household characteristics. Each panel contrasts estimated treatment effects for subgroups below and above the median, with bars denoting point estimates and error bars indicating 90% confidence intervals.

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A Appendix Tables

Table A1: Balance Table

	Overall	Control	Training Only	Training + Helper	Training + Facilitator	Training Only vs. Control	Training + Helper vs. Control	Training + Facilitator vs. Control
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Demographics								
Child's Age (months)	47.644	48.131	48.095	47.781	46.570	-0.035	-0.350	-1.560
	(12.000)	(12.550)	(11.872)	(12.220)	(11.279)	(1.100)	(1.178)	(1.073)
Child's Gender (female)	0.503	0.495	0.499	0.519	0.500	0.005	0.024	0.005
	(0.500)	(0.500)	(0.500)	(0.500)	(0.500)	(0.024)	(0.024)	(0.022)
Number of Adults in HH	3.135	3.115	3.007	3.233	3.189	-0.108	0.118	0.074
	(1.533)	(1.433)	(1.442)	(1.581)	(1.661)	(0.093)	(0.095)	(0.130)
Number of Siblings	1.253	1.185	1.338	1.225	1.265	0.153	0.039	0.079
	(1.130)	(1.039)	(1.189)	(1.154)	(1.129)	(0.099)	(0.090)	(0.104)
Asset Index	7.800	7.803	7.721	7.836	7.841	-0.082	0.033	0.038
	(3.315)	(3.319)	(3.241)	(3.501)	(3.203)	(0.306)	(0.313)	(0.286)
Caregiver's Gender (female)	0.835	0.816	0.847	0.833	0.845	0.031	0.017	0.029
	(0.371)	(0.388)	(0.360)	(0.373)	(0.362)	(0.025)	(0.027)	(0.025)
Caregiver's Education	2.834	2.898	2.777	2.810	2.849	-0.121	-0.089	-0.049
	(1.374)	(1.330)	(1.389)	(1.399)	(1.379)	(0.118)	(0.129)	(0.120)
Panel B: Developmental Outcomes and Caregiver Attitude								
Baseline ASQ Score	0.036	0.000	0.108	0.099	-0.061	0.108	0.099	-0.061
	(0.950)	(0.999)	(0.895)	(0.919)	(0.983)	(0.078)	(0.082)	(0.078)
Confidence towards Disability Index	-0.005	0.000	0.071	-0.052	-0.041	0.071	-0.052	-0.041
	(1.033)	(1.000)	(1.101)	(0.980)	(1.042)	(0.078)	(0.073)	(0.081)
Attitude towards Disability Index	-0.096	0.000	-0.076	-0.134	-0.175	-0.076	-0.134	-0.175
	(0.929)	(1.000)	(0.917)	(0.903)	(0.887)	(0.069)	(0.075)*	(0.068)**
Baseline Communication Index	0.044	0.000	0.106	0.116	-0.043	0.106	0.116	-0.043
	(0.950)	(0.999)	(0.878)	(0.930)	(0.977)	(0.078)	(0.084)	(0.085)
Problem Solving Index	-0.018	0.000	0.018	-0.015	-0.076	0.018	-0.015	-0.076
	(0.997)	(0.999)	(0.990)	(0.972)	(1.024)	(0.077)	(0.077)	(0.072)
Baseline PESL Index	0.037	0.000	-0.040	0.043	0.146	-0.040	0.043	0.146**
	(0.989)	(1.000)	(0.985)	(0.972)	(0.990)	(0.061)	(0.072)	(0.070)
Baseline Stress Index	0.066	0.000	-0.009	0.116	0.160	-0.009	0.116	0.160
	(1.073)	(1.000)	(1.059)	(1.077)	(1.145)	(0.091)	(0.098)	(0.099)
Respondent thinks child has Disability	0.096	0.164	0.024	0.164	0.034	-0.141	0.000	-0.130
	(2.559)	(3.580)	(0.152)	(3.679)	(0.182)	(0.127)	(0.186)	(0.127)
Observations	3,004	766	757	725	756			

Notes: The table reports descriptive statistics and balance tests, showing group means and mean differences between treatment and control schools. Columns (1)–(5) present means for the overall sample, the control group, the training-only group, the training plus classroom helper group, and the training plus outside facilitator group, respectively. Columns (6)–(8) report differences in means between each treatment group and the control group. Standard errors clustered at the school level are reported in parentheses. The analysis sample comprises 3,004 student respondents from the Endline Survey. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table A2: Treatment Effects on Child Development and Caregiver Outcomes with Baseline Controls

	ASQ Index	PESL Index	Caregiver Stress Index
	(1)	(2)	(3)
Panel A: Pooled Treatment Arms			
Any Treatment	0.13***	0.11**	0.03
	(0.05)	(0.05)	(0.05)
Observations	3,004	3,003	2,987
Panel B: Combining Training and Help			
Training Only	0.16***	0.14**	-0.01
	(0.05)	(0.06)	(0.06)
Training plus any help	0.10*	0.09**	0.05
	(0.05)	(0.05)	(0.05)
Observations	3004	3003	2987
Panel C: Individual Treatment Arms			
Training Only	0.17***	0.13**	-0.01
	(0.05)	(0.06)	(0.06)
Training + Helper	0.12*	0.14**	-0.01
	(0.06)	(0.06)	(0.06)
Training + Facilitator	0.10	0.06	0.10*
	(0.06)	(0.05)	(0.06)
Observations	3004	3003	2987
Baseline Control	Yes	Yes	Yes

Notes: The table reports results for the main outcomes estimated using regression equation (1), with baseline controls included for each outcome. Baseline controls refer to the corresponding outcome measured at baseline (e.g., baseline ASQ score for ASQ outcomes, baseline PESL index for PESL outcomes, and baseline stress index for caregiver stress outcomes).Outcomes are standardized relative to the control group for the aggregate Ages and Stages Questionnaire (ASQ), the Practice of Early Stimulation and Learning (PESL), and the Caregiver Stress Indexes. All regressions include municipality fixed effects. *Any Treatment* equals one if a school received training only, training plus a classroom helper, or training plus an outside facilitator, and zero otherwise. The analysis sample comprises 3,004 student respondents from the Endline Survey. Standard errors clustered at the school level are reported in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

Table A3: Attrition

Predictor Variable	Coefficient	P-value
	(1)	(2)
Panel A: Differential Attrition (Treatment vs. Control)		
Only Training	0.029	0.20
	(0.023)	
Training + Helper	0.022	0.25
	(0.019)	
Training + Facilitator	0.006	0.52
	(0.019)	
Panel B: Baseline Predictors of Attrition		
Age of the Child	-1.224	0.38
	(1.389)	
Gender of Child (Female = 1)	-0.070	0.10
	(0.041)	
Number of Adults in HH	-0.002	0.99
	(0.158)	
Number of Children under 18	0.136	0.43
	(0.172)	
Asset Index	-0.937	0.04
	(0.447)	
Gender of Caregiver (Female = 1)	-0.054	0.14
	(0.036)	
Education of Caregiver	-0.215	0.07
	(0.117)	
Baseline PESL Index	-0.080	0.37
	(0.089)	
Baseline Stress Index	-0.079	0.43
	(0.099)	
Baseline ASQ Index	-0.066	0.51
	(0.102)	

Notes: The table reports attrition results from the endline survey. Panel A shows coefficients from OLS regressions of an attrition indicator (equal to one if a student was not observed at endline and zero otherwise) on treatment group indicators. Panel B presents coefficients from OLS regressions of the same attrition indicator on baseline child and household characteristics. All specifications include municipality fixed effects. Standard errors, clustered at the school level, are shown in parentheses, and corresponding p-values are reported in Column (2).

Table A4: Lee Bounds Estimates of Treatment Effects

Outcome	Lower Bound [95% Conf. Interval]	Upper Bound [95% Conf. Interval]
	(1)	(2)
ASQ Index	0.066	0.229
	[-0.022, 0.153]	[0.136, 0.322]
PESL Index	-0.116	0.121
	[-0.189, -0.043]	[0.042, 0.199]
Stress Index	-0.119	0.051
	[-0.220, -0.019]	[-0.049, 0.151]

Notes: The table reports upper and lower bounds on treatment effects for the ASQ, PESL, and Stress indexes, accounting for attrition from the endline sample. Bounds are estimated following Lee (2009). Ninety-five percent confidence intervals are shown in brackets beneath each estimate.

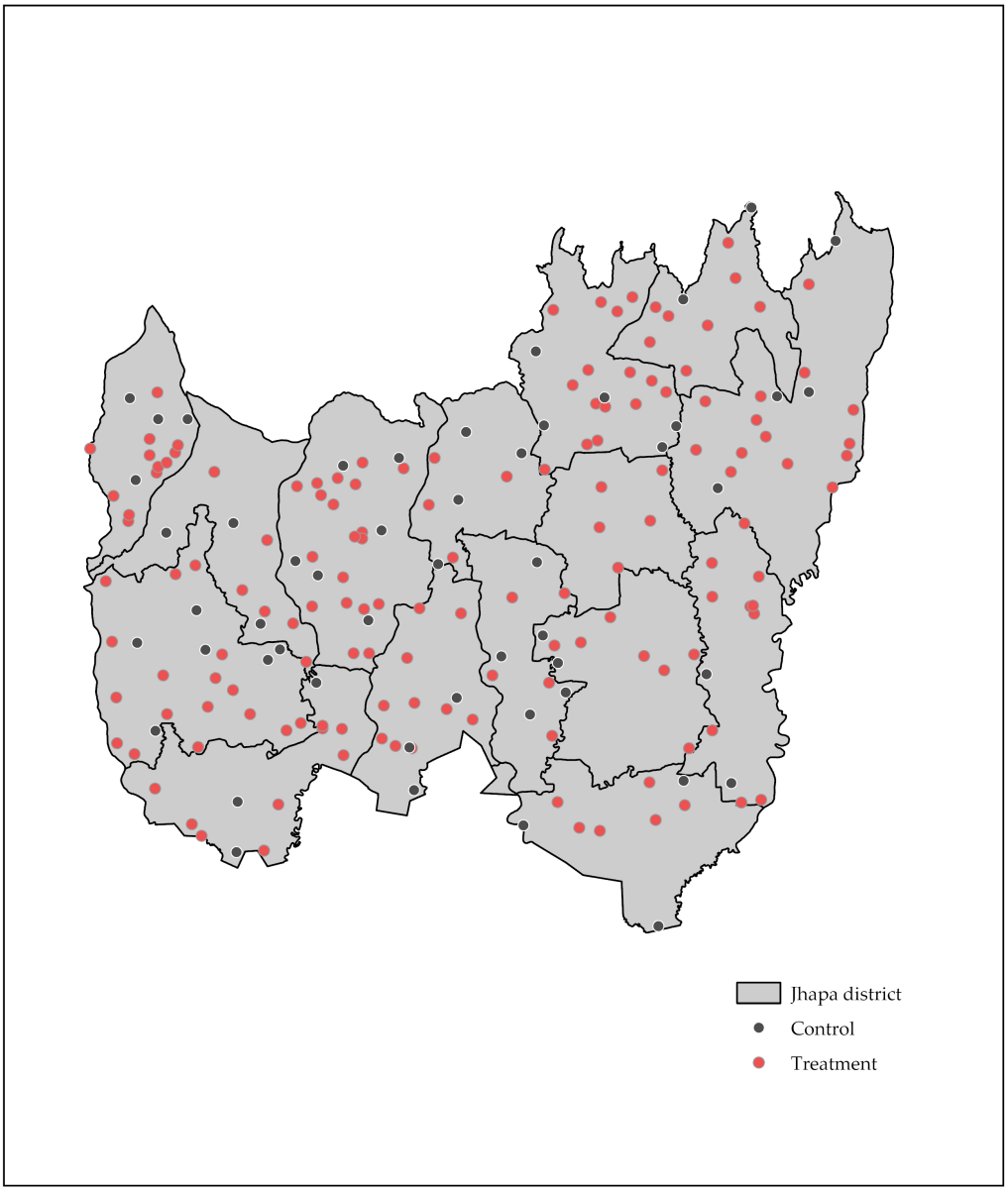
Table A5: Non-compliance in PE Sessions

Baseline Characteristic	Coefficient	P-value
	(1)	(2)
Age of the Child	0.894	0.42
	(1.105)	
Gender of Child (Female = 1)	0.031	0.31
	(0.030)	
Number of Adults in HH	0.313	0.03
	(0.143)	
Number of Siblings	0.102	0.28
	(0.094)	
Asset Index	0.023	0.94
	(0.297)	
Gender of Caregiver (Female = 1)	-0.067	0.05
	(0.035)	
Education Level of Caregiver	-0.356	0.012
	(0.139)	
Baseline ASQ Index	0.031	0.67
	(0.073)	
Baseline PESL Index	0.019	0.79
	(0.072)	
Baseline Stress Index	-0.012	0.92
	(0.125)	

Notes: The table reports associations between non-compliance in PE sessions and baseline child and household characteristics. The dependent variable equals one if a student's school did not conduct PE sessions and zero otherwise. Coefficients are estimated by OLS with municipality fixed effects. Standard errors, clustered at the school level, are reported in parentheses, and corresponding p-values are shown in Column (2).

B Appendix Figures

Figure A1: Map of Distribution of Treatment and Control Schools across Jhapa District



C Teacher Education Training Sessions

C.1 Overview

This appendix provides a summary of the 10 day education training sessions for teachers and facilitators of the parental education sessions.

C.2 Session Details

No.	Topic and Session Details
1	**Conceptual Understanding of Early Childhood Development** On Day I of the Early Childhood Development (ECD) Training of Trainers, teachers engaged in a comprehensive learning journey exploring the foundations of child development. They began with introductions and a pre-test, then delved into understanding ECD concepts, exploring its importance from multiple perspectives including brain development and early learning. Throughout the day, the teachers focused on the major domains of child development (physical, social, emotional, cognitive, and language development). The teachers participated in interactive activities such as group presentations, brainstorming sessions, and a debate on biological versus environmental factors influencing child growth. They examined child development domains (physical, social, emotional, cognitive, and language), identified ECD guiding principles, and concluded the day by reflecting on the benefits of quality ECD experiences for children, families, and society through group work and a collaborative feedback circle.
2	**Child Growth and Development** On Day II of the Early Childhood Development training, teachers explored the comprehensive landscape of child growth and development. They began by discussing the benefits of ECD, then examined developmental milestones from prenatal stages through early childhood, covering key developmental periods from birth to 96 months. The session progressed to an in-depth exploration of childhood disabilities, focusing on understanding different types of disabilities, their causes, and preventive strategies. Teachers engaged in discussions about inclusive education, learning how to create supportive environments for children with diverse needs. They also analyzed child behavior and disorders, developing skills to recognize, understand, and address behavioral challenges. The day concluded with a reflective session where participants wrote diary notes, encouraging personal growth and deeper understanding of the complexities of early childhood development.

No.	Topic and Session Details
3	**ECD Policies, Child Health, Nutrition, Care** On Day III, teachers explored ECD policies, child rights, health, and nutrition through an interactive and analytical approach. The day began with participants sharing personal stories and reviewing developmental milestones, then progressed to analyzing the situation of children in local contexts, examining their basic needs and rights. They thoroughly discussed constitutional provisions, child rights based on UNCRC, and the holistic development of children, with a particular focus on the Nepalese context. The session covered critical aspects such as health, nutritional, and protection needs, and participants reviewed existing acts and provisions. A significant portion of the day was dedicated to understanding the ECD National Strategy 2077, the Nurturing Care Framework, and exploring the roles of local authorities, parents, and stakeholders in ECD implementation. Teachers also examined development plans, including the School Sector Development Plan and Sustainable Development Goals, concluding with a reflection on the federal government's role in early childhood development across different administrative levels.
4	**ECD Programs** On Day IV, teachers explored comprehensive ECD program management and implementation strategies. The day began with participants reflecting on their previous assignments and discussing the role of government in ECD, then transitioned into an in-depth examination of various ECD program models including parenting programs, home-based, community-based, and school-based initiatives. The session covered critical aspects of ECD center management, including daily operations, physical and learning environments, and the roles of teachers, parents, and community members. Teachers also participated in interactive activities such as role-plays focusing on WASH (Water, Sanitation, and Hygiene) management, resource mobilization techniques, and exploring coordination and communication strategies. The day concluded with participants identifying opportunities for quality ECD management and evaluating the day's learnings.
5	**ECD Curriculum** On Day V of the Early Childhood Development training, teachers engaged in an exploration of the ECD national curriculum, focusing on its fundamental components, implementation strategies, and holistic child development approach. The day began with reflections on previous management learnings and then delved deeply into the 2061 National Curriculum, examining its goals, objectives, learning environments, instructional strategies, and approaches to inclusive education. Participants analyzed core competencies, developmental skills, and early learning frameworks, with particular emphasis on understanding holistic child development. The session included interactive activities such as paired discussions on integrated thematic learning, debates on school readiness, and collaborative creation of theme-based web charts linking developmental domains and learning concepts. Teachers explored practical aspects of ECD curriculum implementation, including daily routine activities, early literacy and math concepts, and strategies for creating inclusive and developmentally appropriate learning environments. The day concluded with participants preparing weekly and daily theme-based plans, reflecting a hands-on approach to understanding and applying ECD curriculum principles.

No.	Topic and Session Details
6	**Early Learning and Development** On Day VI, teachers focused on in-depth learning assessment, play-based pedagogical approaches, and practical implementation strategies for early childhood education. The day began with participants reflecting on previous curriculum learnings and then transitioned into exploring various assessment techniques, observation methods, and documentation strategies for tracking children's developmental progress. Teachers engaged in interactive sessions discussing developmentally appropriate assessment practices, learning how to create meaningful documentation that captures children's holistic growth across different developmental domains. The session included hands-on activities such as designing observation tools, practicing documentation techniques, and understanding how to use assessment data to inform teaching strategies. Participants examined play-based learning approaches, exploring how different types of play contribute to children's cognitive, social, emotional, and physical development. The day concluded with collaborative work on creating assessment frameworks and play-based learning strategies.
7	**Instruction and Learning** On Day VII, teachers dove into child-centered instruction and learning approaches, focusing on creating inclusive, engaging, and developmentally appropriate educational experiences. Teachers extensively examined child-centered instruction strategies, discussing early learning principles, sensitive learning periods, and effective approaches to educational engagement. A significant portion of the day was dedicated to hands-on group activities exploring various child-centered learning techniques, including play, songs, rhymes, drama, role-play, art, craft, and storytelling. Participants also focused on critical aspects of inclusive education, particularly strategies for engaging children with disabilities and understanding different types of learning disabilities. The session emphasized practical skill development, with teachers working collaboratively to create theme-based learning materials, songs, stories, and activities that promote holistic child development.
7	**Child Learning and Development Assessment** Day VII of the Early Childhood Development training was broken into two parts. In the second half of the day, teachers explored comprehensive child assessment strategies, focusing on continuous and holistic methods of evaluating children's development and learning progress. The day began with participants displaying their theme-based learning materials and then transitioned into an in-depth examination of continuous assessment techniques, emphasizing the importance of ongoing, contextual evaluation methods. Teachers learned about various assessment approaches, including direct and indirect methods such as observation, interaction, questioning, and performance analysis, with a particular focus on assessing progress across physical, cognitive, emotional, social, and language domains. Participants engaged in practical sessions on developing assessment tools, learning how to record and interpret children's developmental status through methods like child intake forms, monitoring and evaluation documents, and comprehensive child portfolios. The day concluded with participants preparing individual child case reports, reflecting a thorough and empathetic approach to understanding and documenting children's learning journeys.

No.	Topic and Session Details
8	**Teacher's Performance Development (TPD) for ECD Facilitators** On Day VIII, teachers focused on professional development for ECD facilitators, exploring comprehensive strategies for enhancing teaching performance and competence. The day began with participants sharing case reports from previous assessments and then delved into the critical aspects of Teachers Professional Development (TPD), examining its conceptual frameworks, importance, and practical implementation. Participants engaged with detailed TPD curriculum models specifically designed for ECD facilitators, reviewing resource materials and understanding the nuanced approaches to professional growth. The session included presentations from HCRD (Human Capital and Resource Development) authorities, who provided insights into performance evaluation methods, test types, and assessment tools for educators. Teachers learned about various evaluation techniques, report preparation strategies, and documentation practices essential for continuous professional improvement.
9	**Model Training Curriculum** On Day IX of the Early Childhood Development training, teachers engaged in a comprehensive exploration of the Teachers Professional Development (TPD) Model Training Curriculum, focusing on creating and implementing robust professional development frameworks for ECD facilitators. The day was structured around developing a detailed 10-day facilitator training program, with participants meticulously preparing session contents and contextual facilitation plans. Teachers worked collaboratively to develop five-day project plans, reviewing and presenting ECD TPD documents to ensure comprehensive and adaptable professional development strategies. The session included practical simulation activities, where participants practiced demonstration teaching and facilitation techniques, gaining hands-on experience in implementing training contents. Participants also focused on developing training implementation guidelines, exploring coordination methods, reporting techniques, and various assessment approaches. The day concluded with a comprehensive evaluation of the entire Training of Trainers (TOT) program, reflecting on the learning journey and synthesizing the key insights gained throughout the multi-day professional development experience.
10	**Project work, field based learning and Evaluation and Assessment** On Day X of the Early Childhood Development Training of Trainers, teachers engaged in a comprehensive culmination of their learning journey, focusing on practical application, project implementation, and final assessment of their acquired skills and knowledge. The day began with a detailed exploration of facilitator evaluation criteria, including marking rules and grading procedures, emphasizing the importance of rigorous professional assessment. Participants developed practical project work plans for ECD centers, creating actionable strategies to apply their newfound knowledge and skills. Teachers collaboratively prepared comprehensive action plans covering facilitator training, self-study, coordination, communication, and report preparation, demonstrating their ability to translate theoretical learning into practical implementation. The session included a multi-faceted evaluation process examining participants' attendance, assignments, written tests, project practices, and reports. The training concluded with feedback collection, a review of the entire 10-day learning experience, and a closing ceremony that celebrated the participants' professional growth and commitment to early childhood development.

D Participatory Education Training Sessions

D.1 Overview

This appendix provides a summary of the 20 participatory education training sessions, outlining key topics and learning objectives.

D.2 Session Details

No.	Topic and Session Details
1	**Introduction and Importance of Early Child Development** Introduces the critical importance of early childhood (pregnancy to age 8) for physical, cognitive, emotional, and social development. Key points include rapid brain growth, building a foundation for lifelong learning, and parents' role in providing nurturing care, safety, and equal opportunities. Discussion topics include perceptions of early childhood and challenges, with a focus on the responsibility of parents to foster healthy development through active participation and positive role modeling.
2	**Role of Father in Early Child Development** Defines the role of the father in early childhood development and shared parental responsibilities because a nurturing father-child relationship is beneficial to the well-being of a child. Fathers should provide prenatal support, emotional bonding, be actively involved in supporting mother and child. Discussion focuses on challenges and ways in which fathers can stay engaged.
3	**Early Child Development Programs and Responsible Sections and Institutions** This sections informs parents about local government and non-government programs that support early childhood development. These include parenting education, home-based development, entry-level childcare, and early childhood programs focused on children's physical, cognitive, and emotional growth. Key takeaways for parents include identifying available programs and ensuring that essential needs such as vaccination, healthcare, nutrition, clean drinking water, security, and early education are met.
4	**Care of Mothers, Children During Pregnancy, and Newborn Infants** Provides a comprehensive guide for caring for mother and child from pregnancy to early infancy, covering maternal and child health, family support, preparation for birth, and early newborn needs. Parents learn about fetal development, nutrition, safe delivery practices, early infant care, and developmental milestones. The session also addresses postpartum recovery and emotional well-being, ensuring parents feel confident in their journey from pregnancy to parenthood.

No.	Topic and Session Details
5	**Stimulation In Early Childhood** Emphasizes the importance of sensory and kinesthetic stimulation in brain development. Parents learn how visual, auditory, tactile, gustatory, and kinesthetic stimulation promotes brain development and learning. The discussion covers the benefits of stimulation, the risks of its absence, and the caregivers' role in creating a environment that fosters cognitive, emotional, and physical development.
6	**Components of Early Child Development** Details five key aspects of child development: physical, cognitive, linguistic, emotional, and social. Parents learn all aspects are interrelated and that nutrition, stimulation, health services, protection, care, and learning opportunities encourage holistic development. Parental responsibilities include providing proper health and education, as well as fostering a supportive environment through consistent engagement and role modeling. Discussion explores challenges and how to best support development.
7	**Early Childhood Development Stages and Characteristics** Outlines developmental phases of early childhood, as well as milestones and age-appropriate activities that align with each stage. Parents are taught to identify each stage and what factors contribute to well-rounded growth. This session encourages discussion on observed child behaviors, ways to accelerate development, and importance of engagement, protection, and proper care in early childhood.
8	**Early Detection of Children with Special Needs** Parents learn how to identify disabilities in infants and children, along with the importance of early detection and appropriate support. Learning objectives include familiarity with different types of disabilities, their causes, preventative measures, and indicators for early diagnosis. Preventive measures include maternal care, vaccinations, and safe childbirth practices. Parents and guardians are encouraged to focus on their children's abilities rather than their limitations, as it is important to create an inclusive environment where children with disabilities receive equal opportunities for development. Parents of children with disabilities are encouraged seek available resources, including disability identity cards and support services.
9	**Causes and Prevention of Child Malnutrition** Malnutrition is taught as an imbalance between the essential elements required by the body that can be identified as acute malnutrition (wasting), chronic malnutrition (stunting), underweight, or micronutrient deficiencies. Parents learn its causes, symptoms, and prevention strategies. Causes include hereditary factors, lack of awareness, insufficient maternal nutrition, food insecurity, vitamin and mineral deficiencies, and frequent illness. Prevention methods involve maternal and child nutrition, exclusive breastfeeding, regular health check-ups, hygiene, and utilizing government nutrition programs. Parents play a key role in providing balanced diets, and monitoring growth.

No.	Topic and Session Details
10	**Child Health and Care** Parents learn the importance of nurture and timely treatment in protecting children from illnesses. This involves ability to identify symptoms, their causes, preventive measures, and provide appropriate care—including emotional support. Common childhood diseases are fever, pneumonia, diarrhea, and infections. Home remedies and medical interventions for various illnesses are discussed, stressing the need for attentive caregiving and prompt medical consultation when necessary.
11	**Prevention of Harmful Contagious Diseases In Children** Brings awareness to child-fatal contagious diseases and their prevention through full immunization. Diseases such as tetanus, tuberculosis, diphtheria, polio, and measles, along with their symptoms, transmission methods, and available vaccines are discussed. Parents are encouraged to follow immunization schedules, recognize early symptoms, and seek immediate medical care when necessary. The government provides free vaccines to all children, so parents must get their children vaccinated.
12	**Child Behavior and Positive Discipline;** **Protection of Children from Violence, Abuse, and Punishment** Children develop habits and behavior by observing their parents and environment. Parents learn their importance as role models and reinforcers of good habits through praise, consistency, and positive engagement. Harsh discipline and neglect negatively impact personality development, while encouragement and structured support help children manage emotions and behavior effectively. Violence, abuse, and discrimination have lasting detrimental effects and are violations of children's rights. A nurturing, non-discriminatory environment with clear expectations, encouragement, and legal protections is essential for healthy child development.
13	**Child Safety, Protection from Accidents, and Learning in Emergencies** Creating a safe environment and emergency preparedness at home and in the community protects children from accidents, ensures their safety and continued development. Children are naturally curious and may not foresee dangers so childproofing and risk through stories and demonstrations are essential. Preventative measures include securing hazardous objects and keeping them out of reach, teaching road safety, and supervising child activities. In emergencies, knowing basic first aid—such as treating burns, cuts, and fractures—can be lifesaving. Disaster preparedness involves identifying hazards, planning emergency responses, storing essential supplies, and practicing evacuation drills.
14	**Importance of Early Childhood Learning** Introduces the importance of early childhood learning through play and experience-based methods. Babies learn from birth by engaging with their environment using their senses, imitation, problem-solving, and exploration. These early experience significantly impact brain development due to rapid formation of neural connections in the first three years. Age-appropriate sports and activities are suggested for cognitive and social development. The role of parents is to provide a stress-free, nurturing environment, engage in the play, and encourage curiosity through storytelling and conversation. Discussion includes children's learning processes and suitable play activities.

No.	Topic and Session Details
15	**Child-Centered Learning Activities** Children learn best when provided with opportunities and an environment suited to their age, interests, and abilities. This session focuses on child-centered learning that is safe, healthy, inclusive, and stimulating. Child-centered activities include sports, storytelling, music, dance, drawing, and nature observation. These help develop creativity, communication skills, confidence, problem-solving abilities, and leadership. Parents' role is to create spaces for play and ensuring learning aligns with a child's natural curiosity.
16	**Utilization of Local Learning Materials** Discusses the use and availability of homemade toys and locally sourced learning materials in a child's development. Homemade toys crafted from readily available resources are cost-effective and culturally relevant and promote creativity, emotional bonding, and cognitive skills. Locally made toys like dolls, puppets, soft balls, and pictorial storybooks aid in language development, motor skills, and social learning. Parents are responsible for ensuring these materials are safe, age-appropriate, and accessible while creating a supportive play environment.
17	**Early Literacy and Numeracy Skills in Children** Explains the importance of early exposure to language and numeracy skills through everyday activities rather than formal instruction before school. Children develop communication, literacy, and numeracy skills naturally through interactions, storytelling, counting household objects, and recognizing shapes in their surroundings. Early literacy elements include awareness of print and signs, listening, speaking, and recognizing letters, while early numeracy focuses on measurement, sorting, and geometric concepts. Parents play a crucial role in fostering these skills by integrating learning into daily routines, reading to children, and encouraging exploration through play.
18	**Child Development Center and Pre-Primary Classes** Child Development Centers (CDCs) provide early learning experiences that are accessible for all children before formal schooling. Parents are instructed to enroll children above three years and below five years of age at CDCs where they can participate in pre-primary classes and learn in a safe and stimulating environment through activities like storytelling, music, and creative play. Parents can reinforce education received at CDCs by talking to their children about lessons and focusing on holistic development, not just educational progress.
19,20	**Disability Modules** Raise awareness about childhood disabilities—their causes, types, and ways to support children effectively. Interactive methods such as storytelling and simple games are used to help caregivers understand the functional challenges children may face and how to address them with empathy and inclusion. Sessions emphasize the importance of early identification, reducing stigma, and creating supportive environments at home and in the community. Real-life examples are used to spark discussion and reflection, encouraging caregivers to embrace inclusive practices. Participants also share key definitions from Nepal's disability framework and guide families on how to seek relevant services and support.

E Outcome Variables

E.1 Overview

This appendix provides details on the pre-specified outcomes in the pre-analysis plan registered at RCT ID: AEARCTR-0011318.

E.2 Secondary Outcomes: Quality of ECD and ECD Center

Outcome	Definition
Quality of the ECD: Teacher-Student Interaction	*Response Options: 1 if Yes, 0 if No.* *Note:* There are two indices: (i) Positive index *The sum of responses to B1, B2, B3, B4, B5, B6, B7, B9, and B10 across 20 rounds of observation.* (ii) Negative index *The sum of responses to B8, B11, B12, B13, and B14 across 20 rounds of observation.* 1. Reading to a small/large group. 2. Teachers or Students singing. 3. Circle time: Child leading a whole class activity. 4. Back and forth discussion/conversation in a circle time. 5. Back and forth discussion/interaction/conversation with a small group or one child. 6. Engaging in pretend play with children/child. 7. Telling child or children what to do (not back-and-forth discussion). 8. Negative discipline. 9. Calmly negotiating conflict between peers. 10. Smiling/positive affect. 11. Negative affect/yelling. 12. Teacher is sitting at her desk or not engaged with children. 13. Teacher is talking with another adult. 14. Teacher out of the classroom.
Quality of the ECD: Teacher-Student Interaction	*Coded: 1 if Yes, 0 if No, discarded if N/A* *The index will be the additive sum of the responses* 1. Teacher has prepared yearly, monthly and daily plans. 2. Teachers follows standard daily time table (as learnt during the training). 3. Stories, poems and songs are regularly used in ECD center. 4. ECD center and classroom are regularly cleaned. 5. Access to safe drinking water. 6. Access to Child friendly washroom and toilets. 7. Child-friendly, clean (free from dust); adequate space classroom; Proper seating arrangement in ECD center (Use of carpet, pre fab, cushions, round tables etc. 8. Six learning areas management and arrangement of learning materials accordingly. 9. Language learning areas arrangement and management. 10. Science learning areas arrangement and management.

11. Play/Act/role-play skills related learning areas arrangement and management.
12. Creativity learning areas arrangement and management.
13. Math learning areas arrangement and management.
14. Construction/Materials development learning areas arrangement and management.
15. Use of learning and play materials and conducts activities accordingly.
16. Teacher takes daily attendance of all children (attendance registers maintained).
17. Teacher also conducts appropriate and disable-friendly activities for children with disability.
18. Use of ECD Kit Box in children's daily activities.
19. Regular observation/monitoring/supervision and guidance by HT.
20. Teachers have maintained records on students' progress (as per the prescribed formats).

E.3 Child Primary Outcomes: Ages and Stages Questionnaire Score

Note: *Each response in this subsection will be scored in accordance with the standard methodology used for scoring ASQ in the literature. Aggregate score in this section will be the sum of individual scores for all these questions.*

Aggregate ASQ score is the sum of scores in all five subsections: Communication, Gross Motor, Fine Motor, Problem- solving, and Personal-social.

Subsection of ASQ (36 month)	**Definition**
Communication	1. When you ask your child to point to her nose, eyes, hair, feet, ears, and so forth, does she correctly point to at least seven body parts? 2. Does your child make sentences that are three or four words long? 3. Without giving your child help by pointing or using gestures, ask him to "put the book on the table" and put the shoe under the chair". Does your child carry out both of these directions correctly? 4. When looking at a picture book, does your child tell you what is happening or what action is taking place in the picture (for example, "barking","running", "eating" or "crying"?) 5. Show your child how a zipper on a coat moves up and down, and say, "See, this goes up and down". Put the zipper to the middle and ask our child to move the zipper down. Return the zipper to the middle and ask your child to move the zipper up. Do this several times, placing the zipper in the middle before asking you child to move it up or down. Does your child consistently move the zipper up when you say "up" and down when you say "down"?
Gross Motor	1. Without holding onto anything for support, does your child kick a ball by swinging his leg forward? 2. Does your child jump with both feet leaving the floor at the same time? 3. Does your child walk up stairs, using only one foot on each stair? 4. Does your child stand on one foot for about 1 second without holding onto anything?

5. While standing, does your child throw a ball overhand by raising his arm to shoulder height and throwing the ball forward?
6. Does your child jump forward at least 6 inches with both feet leaving the ground at the same time?

Fine Motor

1. After your child watches you draw a line from the top of the paper to the bottom with a pencil, crayon, or pen, ask her to make a line like yours. Do not let your child trace your line. Does your child copy you by drawing a single line in a vertical direction?
2. Can your child string small items such as beads, macaroni, or pasta "wagon wheels" onto a string or shoelace?
3. After your child watches you draw a single circle, ask him to make a circle like yours. Do not let him trace your circle. Does your child copy you by drawing a circle?
4. After your child watches you draw a line from one side of the paper to the other side, ask her to make a line like yours. Do not let your child trace your line. Does your child copy you by drawing a single line in a horizontal direction?
5. Does your child try to cut paper with child-safe scissors? He does not need to cut the paper but must get the blades to open and close while holding the paper with the other hand.
6. When drawing, does your child hold a pencil, crayon, or pen between her fingers and thumb like an adult does?

Problem-Solving

1. While your child watches, line up four objects like blocks or cars in a row. Does your child copy or imitate you and line up four objects in a row?
2. If your child wants something he cannot reach, does he find a chair or box to stand on to reach it (for example, to get a toy on a counter or to "help" you in the kitchen?
3. When you point to the figure and ask your child, "What is this?" does our child say a word that means a person or something similar? Please write your child's response.
4. When you say, "Say 'seven three'", does your child repeat just the two numbers in the same order? Do not repeat the numbers. If necessary, try another pair of numbers and say, "Say 'eight two'".
5. Show your child how to make a bridge with blocks, boxes, or cans, like the example. Does our child copy you by making one like it?
6. When you say, "Say 'five eight three'", does our child repeat just the three numbers in the same order? Do not repeat the numbers. If necessary, try another series of numbers and say. "Say 'six nine two'".

Personal-Social

1. Does your child use a spoon to feed herself with little spilling?
2. Does your child push a little wagon, stroller, or toy on wheels, steering it around objects and backing out of corners if he cannot turn?
3. When your child is looking in a mirror and you ask, "Who is in the mirror?" does she say either "me" or her own name?
4. Does your child put on a coat, jacket, or shirt by himself?
5. Using these exact words, ask your child, "Are you a girl or a boy?" Does our child answer correctly?
6. Does your child take turns by waiting while another child or adult takes a turn?

Subsection of ASQ (48 month)	Definition
Communication	1. Does your child name at least three items from a common category? 2. Does your child answer the following questions? (Mark "sometimes" if your child answers only one question.) a. "What do you do when you are hungry?" Please write your child's response. b. "What do you do when you are tired?" Please write your child's response. 3. Does your child tell you at least two things about common objects? 4. Does your child use endings of words, such as "-s," "-ed," and "-ing"? 5. Without your giving help by pointing or repeating, does your child follow three directions that are unrelated to one another? Give all three directions before your child starts. 6. Does your child use all of the words in a sentence (for example, "a," "the," "am," "is," and "are") to make complete sentences, such as "I am going to the park," or "Is there a toy to play with?" or "Are you coming, too?"
Gross Motor	1. Does your child catch a large ball with both hands? 2. Does your child climb the rungs of a ladder of a playground slide and slide down without help? 3. While standing, does your child throw a ball overhand in the direction of a person standing at least 6 feet away? To throw overhand, your child must raise his arm to shoulder height and throw the ball forward. 4. Does your child hop up and down on either the right or left foot at least one time without losing her balance or falling? 5. Does your child jumpforward a distance of 20 inches from astanding position, starting with his feet together? 6. Without holding onto anything, does your child stand on one foot for at least 5 seconds without losing her balance and putting her foot down?
Fine Motor	1. Does your child put together a five- to seven-piece interlocking puzzle? 2. Using child-safe scissors, does your child cut a paper in half on a more or less straight line, making the blades go up and down? 3. Using the shapes below to look at, does your child copy at least three shapes onto a large piece of paper using a pencil, crayon, or pen, without tracing? 4. Does your child unbutton one or more buttons? 5. Does your child draw pictures of people that have at least three of the following features: head, eyes, nose, mouth, neck, hair, trunk, arms, hands, legs, or feet? 6. Does your child color mostlywithin the lines in a coloring book or within the lines of a 2-inch circle that you draw?
Problem-Solving	1. When you say, "Say 'five eight three,'" does your child repeat just the three numbers in the same order? Do not repeat the numbers. If necessary, try another series of numbers and say, "Say 'six nine two.'" 2. When asked, "Which circle is the smallest?" does your child point to the smallest circle? 3. Without your giving help by pointing, does your child follow three different directions using the words "under," "between," and "middle"? 4. When shown objects and asked, "What color is this?" does your child name five different colors, like red, blue, yellow, orange, black, white, or pink?

	5. Does your child dress up and "play-act," pretending to be someone or something else? 6. If you place five objects in front of your child, can he count them by saying, "one, two, three, four, five," in order?
Personal-Social	1. Does your child serve herself, taking food from one container to another using utensils? 2. Does your child tell you at least four of the following? 3. Does your child wash his hands using soap and water and dry off with a towel without help? 4. Does your child tell you the names of two or more playmates, not including brothers and sisters? 5. Does your child brush her teeth by putting toothpaste on the toothbrush and brushing all of her teeth without help? 6. Does your child dress or undress himself without help (except for snaps, buttons, and zippers)?

Subsection of ASQ (60 month)	**Definition**
Communication	1. Without your giving help by pointing or repeating directions, does your child follow three directions that are unrelated to one another? Give all three directions before your child starts. 2. Does your child use four- and five-word sentences? For example, does your child say, "I want the car"? Please write an example. 3. When talking about something that already happened, does your child use words that end in "-ed," such as "walked," "jumped," or "played"? Ask your child questions, such as "How did you get to the store?" ("We walked.") "What did you do at your friend's house?" ("We played.") Please write an example. 4. Does your child use comparison words, such as "heavier," "stronger," or "shorter"? Ask your child questions, such as "A car is big, but a bus is ..." (bigger); "A cat is heavy, but a man is ..." (heavier); "A TV is small, but a book is ..." (smaller). Please write an example. 5. Does your child answer the following questions? (Mark "sometimes" if your child answers only one question.) a. "What do you do when you are hungry?" Please write your child's response here: b. "What do you do when you are tired?" Please write your child's response. 6. Does your child repeat the sentences shown below back to you, without any mistakes? a. Jane hides her shoes for Maria to find. b. Al read the blue book under his bed.
Gross Motor	1. While standing, does your child throw a ball overhand in the direction of a person standing at least 6 feet away? To throw overhand, your child must raise his arm to shoulder height and throw the ball forward. 2. Does your child catch a large ball with both hands? 3. Without holding onto anything, does your child stand on one foot for at least 5 seconds without losing her balance and putting her foot down?

4. Does your child walk on his tiptoes for 15 feet (about the length of a large car)?
5. Does your child hop forward on one foot for a distance of 4–6 feet without putting down the other foot?
6. Does your child skip using alternating feet?

Fine Motor

1. Ask your child to trace on the line below with a pencil. Does your child trace on the line without going off the line more than two times?
2. Ask your child to draw a picture of a person on a blank sheet of paper. You may ask your child, "Draw a picture of a girl or a boy."
3. Draw a line across a piece of paper. Using child-safe scissors, does your child cut the paper in half on a more or less straight line, making the blades go up and down?
4. Using the shapes below to look at, does your child copy the shapes in the space below without tracing?
5. Using the letters below to look at, does your child copy the letters without tracing? Cover up all of the letters except the letter being copied.
6. Print your child's first name. Can your child copy the letters? The letters may be large, backward, or reversed.

Problem Solving

1. When asked, "Which circle is the smallest?" does your child point to the smallest circle?
2. When shown objects and asked, "What color is this?" does your child name five different colors, like red, blue, yellow, orange, black, white, or pink?
3. Does your child count up to 15 without making mistakes?
4. Does your child finish the following sentences using a word that means the opposite of the word that is italicized? For example: "A rock is hard, and a pillow is soft." Please write your child's responses.

   a. A cow is *big* and a mouse is ...

   b. Ice is *cold*, and fire is ...

   c. We see stars at *night*, and we see the sun during the ...

   d. When I throw the ball *up*, it comes ...
5. Does your child know the names of numbers?
6. Does your child name at least four letters in her name? Point to the letters and ask, "What letter is this?" (Point to the letters out of order.)

Personal-Social

1. Can your child serve himself, taking food from one container to another, using utensils?
2. Does your child wash her hands and face using soap and water and dry off with a towel without help?
3. Does your child tell you at least four of the following? Please mark the items your child knows.
4. Does your child dress and undress himself, including buttoning medium-size buttons and zipping front zippers?
5. Does your child use the toilet by herself? (She goes to the bathroom, sits on the toilet, wipes, and flushes.)
6. Does your child usually take turns and share with other children?

E.4 Caregiver Primary Outcomes: Index of Stress and Practice of Early Stimulation and Learning

Outcome	Definition
Parent (Caregiver) Stress Index	*Response Options: 1- Strongly agree; 5-Strongly disagree.* 1. My child rarely does things that make me feel good. 2. Sometimes I feel my child doesn't like me and doesn't want to be close to me. 3. My child smiles at me much less than expected. 4. When I do things for my child, I get the feeling that my efforts are not appreciated very much. 5. I expected to have closer and warmer feelings for my child than I do, and this bothers me. 6. Sometimes my child does things that bother me just to be mean. 7. I feel that I am ... (*Response Options: 1-Not very good at being a parent; 5-A very good parent.*)
Practice of early stimulation and learning (Index)	*Response Options: 1 if Yes, 0 if No; The index will be the additive sum of the responses.* 1. Read books or looked at picture books with the child. 2. Told stories to the child. 3. Sang songs to or with the child (including lullabies)? 4. Took the child outside the home? 5. Played with the child. 6. Named, counted, or drew things for or with the child.

E.5 Care Givers' Secondary Outcomes

Outcome	Definition	Coding
Attitude to disciplining the Child	Do you think it's necessary or/and normal to spank to discipline your child?	1 - No, 0 - Yes
Intensity of discipline	In the past 14 days, how often have you spanked to discipline your child?	0 - Never, 1 - Once, 2 - Twice, 3 - More than twice
Intensity of early stimulation and learning (index)	How often did you engage in this activity with the child?	The index will be the additive sum of the responses. 1 - Only several times (1-3 days a week), 2 - Often (4-5 days a week), 3 - Nearly every day (6 days a week)

Attitude to Disability	1. Do you believe children with disabilities should be separated from their parents? 2. Do you think schools should accommodate children with disabilities? 3. Do you think disabilities can be helped? 4. I believe that children with disabilities deserve access to educational opportunities	The index will be the additive sum of the responses. 1: 0 - Yes, 1 - No 2 & 3: 1 - Yes, 0 - No 4: 5 - Strongly Agree, 4 - Agree, 3 - Not sure, 2 - Disagree, 1 - Strongly Disagree
Feeling confident to help with disability	1. I have the necessary knowledge and skills to support children with disabilities 2. I feel confident in my ability to support children with disabilities.	The index will be the additive sum of the responses. 5 - Strongly Agree, 4 - Agree, 3 - Not sure, 2 - Disagree, 1 - Strongly Disagree