



Save the Children

Endline Evaluation of the Remote Early Learning Project

Final Report, June 2021

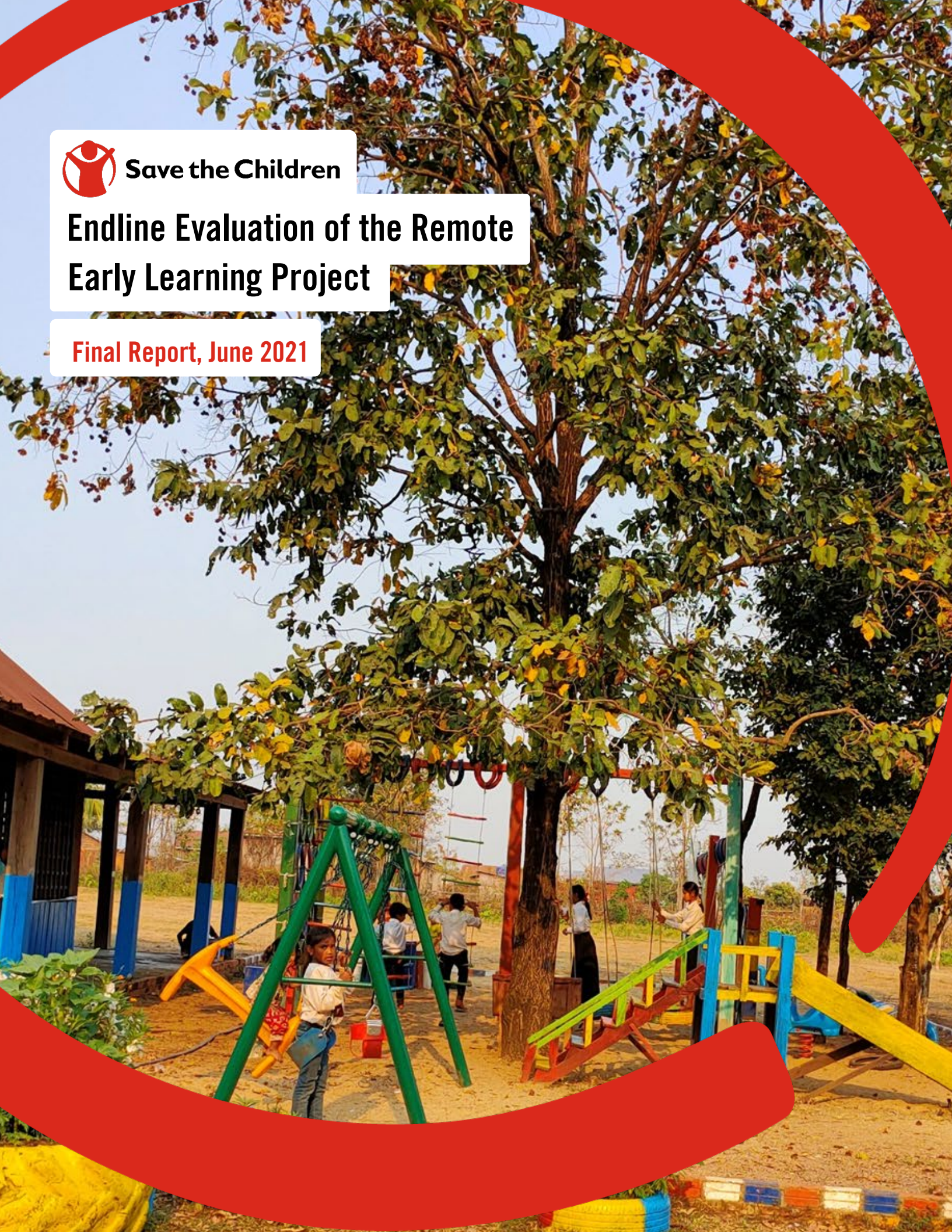


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Remote Early Learning Project | June 2021

Final Report

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Ven Seyhah, PhD

National consultant

Phnom Penh, June 2021

ACRONYMS

DID	Difference-In-Difference
DoE	District Office of Education
DTMT	District Training Monitoring Team
ECCD	Early Childhood Care and Development
ECE	Early Childhood Education
IDELA	International Development and Early Learning Assessment
KII	Key Informant Interview
MoEYS	Ministry of Education, Youth and Sport
PoE	Provincial Office of Education
R.E. Learning	Remote Early Learning
SCI	Save the Children International

EXECUTIVE SUMMARY

Project Overview. The Remote Early Learning (R.E. Learning) project, funded by Save the Children Korea, focused on improving the quality of existing (state and community) preschools in the remote areas of Pursat province, Cambodia. This project aims for children aged three to five years in the target areas, including children from the most impoverished families, children from ethnic minority groups and children with disabilities, to receive opportunities to grow and develop to reach their full learning educational potential through quality preschool services. The project was implemented in Veal Veng district in Pursat province from June 2018 to May 2021.

Purpose of the Evaluation. The evaluation aimed to establish an endline dataset for the project's key indicators that can be used as the basis for measuring the project's impact. Specifically, it aimed to provide rigorous evidence on the efficacy of the R.E Learning project in improving learning and development outcomes for children.

Evaluation Approach. The evaluation was conducted by a team led by Dr Ven Seyhah (National Consultant and Team Leader), Mr Veung Naron and others. Save the Children's MEAL team carried out quantitative data collection. The evaluation was conducted from January to February 2021. A quasi-experimental design was employed to address the study objectives. Eleven preschools in Veal Veng district, Pursat province, were compared with 11 preschools in a neighbouring district called Phnom Kravanh. The sample sizes of children and caregivers in the endline intervention and the baseline intervention, and the endline comparison and the baseline comparison, were the same. Even so, this does not necessarily mean that the same individuals from the baseline survey participated in the endline survey.

Methods. The evaluation employed difference-in-differences methods with random and fixed effects and t-tests. In addition to the quantitative methods, we also conducted key informant interviews (KIIs) with selected stakeholders from both the intervention and the comparison groups, including two officials from the Provincial Office of Education (PoE), two officials from the District Office of Education (DoE), six directors, six teachers and six parents. Data from the qualitative interviews were analysed using in-depth description or text analysis to support the findings of the quantitative analysis.

FINDINGS

Children's learning and development outcomes

The R.E. Learning project has a significant positive effect on early childhood learning and development outcomes. The results suggest that the children who studied in the preschools under the project are likely to increase their total IDELA scores by 29.2 percent, motor development by 19.3 percent, emergent literacy scores by 41.4 percent, emergent numeracy scores by 31.6 percent, and socioemotional development scores by 29.1 percent.

The top five determining factors of children's learning and development are quality of teaching, preschool curriculum, type of preschool teacher as state teacher, caregiver's engagement with child's learning at home, and time spent in preschool. If these factors are enhanced, children's learning and development will improve by around 5 to 12 percent.

Home learning environment

The project significantly improved all dimensions of the home learning environment of the families engaged in the project. Overall home learning environment enhanced by 15.6 percent, reading materials

at home by 22.4 percent, learning toys at home by 25 percent, and caregivers' engagement with children's learning at home by 16 percent.

Classroom quality

The project improved overall classroom quality considerably. In the endline survey, the intervention preschools increased their average quality score from 1 (inadequate) to 3 (good), while those in the comparison group also improved their score from 1 to 2.5. The project enhanced overall classroom quality by 0.9 points (22.5 percent) in addition to the ordinary preschool improvement. The project positively influenced three dimensions of preschool quality: interaction, language and reasoning, and space and furnishing. But it had little effect on teacher-parent conferences and preschool curriculum structure.

Supervision and monitoring and preschool quality

Higher usefulness levels of director and PoE feedback led to better quality interactions. A higher frequency of PoE visits enhanced language and reasoning. In addition, a higher level of usefulness of directors' feedback and more frequent director and PoE visits led to better quality teacher-parent conferences. The variables of supervision and monitoring were not associated with teacher quality.

Teacher motivation

A small incentive scheme is likely to improve teacher motivation regarding time spent, such as preparing lessons in advance, correcting students' work, providing free remedial help to students outside school hours, exchanging ideas or getting help from colleagues at school, and communicating with parents or caregivers. However, it is not likely to improve teachers' motivation regarding other aspects such as their reasons to be teachers, beliefs, and absenteeism.

Caregiver engagement

Caregiver engagement is strongly and positively correlated with preschool quality. KIs with teachers and other education staff fully support these results. Caregiver participation in preschool activities is of utmost importance in teacher performance and children's learning and development outcomes.

Specific challenges for access and quality of preschools in remote areas

Various challenges associated with access to good quality preschool programs in remote areas were raised by parents/caregivers, teachers and other education staff. All respondents stated that the main factors negatively affecting children's access to preschool and preschool quality are:

- Household financial burden
- School distance from home
- Children's safety in commuting,
- Limited number of qualified teachers
- Inadequate school facilities, buildings, and classrooms
- Inadequate study materials
- Lack of qualified teachers
- Caregivers' poor education
- Caregivers' low understanding of educational importance
- Lack of encouragement and motivation from parents and teachers
- Health problems
- Severe weather such as heavy rain.

RECOMMENDATIONS

Based on the quantitative and qualitative analyses, the following recommendations merit consideration:

Children's learning and development outcomes. The project is unlikely to improve certain areas, such as teacher-parent conferences, preschool curriculum structure, and intrinsic motivation in teachers. More attention should therefore be directed towards the project components that can enhance these areas.

Future interventions should invest more in or reinforce the top five factors affecting child development and early learning, namely interaction, preschool curriculum, capacity building for community preschool, caregiver engagement with child learning at home, and at least one year of preschool education.

Supervision and monitoring. The District Training Monitoring Team (DTMT) person and DoE's visit and feedback and mentorship program are not associated with better outcomes for preschool quality. The supervision and monitoring activities of the DTMT person and the DoE and mentorship program should be improved to contribute to preschool quality.

Teacher motivation. The long-term solution to keeping teachers motivated is to tap into their internal drive by providing coaching, mentoring, capacity building, and long-term career advancement. A small incentive package can only stimulate teacher motivation in the short term; when the incentive scheme ends, the associated motivation may also stop.

Community engagement. The active involvement of parents and the community should be further promoted, while the purposes and activities of the project should be communicated and understood among key stakeholders. Local people, especially parents and authorities, should be allowed to help design and implement the project in a way that gives them joint ownership of it.

Outreach and household support. Low-income households need financial support and information that helps ensure children can attend preschool at the right age. Children from these households should also be given the study materials and textbooks they need. Help with home-to-school transport and vice versa would resolve the problem of preschool access, especially for children living far away from preschool.

	<ul style="list-style-type: none"> • Preschool teacher motivation – through piloting intrinsic motivation activities for preschool teachers, designed based on research undertaken in the inception phase of the project (possibly including teacher awards and opportunities for high-performing and innovative teachers to train other teachers and share tools/resources that they have developed)
Family and community engagement	<ul style="list-style-type: none"> • Involvement of parents/caregivers in children’s learning at preschool and home – through regular dialogue between parents/caregivers and preschool teachers, and the provision of training and resources to promote a consistent and complementary approach to learning between home and school and support the holistic development of children in the early years

Furthermore, the R.E. Learning project aims to enhance the accountability and governance of preschools through:

Preschool service management, monitoring and advocacy	<ul style="list-style-type: none"> • At a local level: the project aimed to improve preschool accountability and governance by engaging with parents/caregivers, teachers and other community members and increasing understanding of preschool service standards, activities and performance • At district and provincial level: the project team worked with staff from the Provincial Office of Education and the District Office of Education to improve preschool services and management by encouraging effective technical support for and monitoring of preschools and effective annual operational planning in the region • At national level: the project advocated for sustainable early childhood care and development (ECCD) plans and improved government support for ECCD services through civil society coordination and direct government advocacy
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1.2 EVALUATION QUESTIONS

The following questions guide this impact evaluation:

- 1) What is the impact of the intervention on the early learning and development of targeted children 3-5 years old measured through the average scores from the International Development and Early Learning Assessment (IDELA) of children aged 3 to 5 years?
- 2) What is the impact of the intervention on targeted children’s home learning environments?
- 3) What is the impact of the intervention on classroom quality in targeted preschools?

- 4) What factors (household socioeconomic, home environment, classroom quality, and teacher motivational factors) are related to children's developmental outcomes?

In addition, this impact evaluation addresses the following learning questions:

- a) How can the quality of preschools for children aged 3 to 5 years in remote areas be improved?
 - Technical teacher quality: how can increased supervision and monitoring in remote areas be effectively used to help improve teacher quality?
 - Teacher motivation: does a small incentive scheme of preschool teacher motivation activities improve teacher performance and quality?
 - Caregiver engagement: how does caregiver participation in preschool activities correlate with teacher performance and children's development outcomes?
- b) What are the specific challenges for access and quality in remote areas, and how are these best addressed?

1.3 PURPOSE OF THE EVALUATION

The ultimate objective of this evaluation is to provide rigorous evidence about the impact of the project on early learning and development. An accurate understanding of this project's impact will help improve the quality of preschools for children aged 3 to 5 years in remote areas.

The evaluation aimed to establish an endline dataset for the project's key indicators and constitute a basis for measuring project impact. Thus, the key objectives of the impact evaluation are to:

- 1) Measure the impact of the intervention on the early learning and development of targeted 3-5 year old pre-schoolers using average IDELA scores.
- 2) Measure the impact of the intervention on targeted children's home learning environments.
- 3) Measure the impact of the intervention on classroom quality in targeted preschools.
- 4) Examine factors (household socioeconomic status, home environment, classroom quality, and teacher motivation) related to child developmental outcomes.
- 5) To address the learning questions above.

2 METHODOLOGY

We combined both quantitative and qualitative research methods. The former involved a multilevel quasi-experimental research design, and the latter involved key informant interviews (KIIs) with selected stakeholders.

2.1 EVALUATION DESIGN

We used a multilevel quasi-experimental design to address the study objectives, primarily to measure the impact of the intervention at three different levels on development outcomes for young children. The three levels (hierarchical) are the household, the teacher and the school (environment and management). The effects of these different levels of intervention were examined using a multilevel analysis model. There are variations in child development outcomes across households, teachers and schools. This nesting structure allowed us to examine the multilevel effects on children's developmental outcomes. Examining multilevel effects can help identify the most effective and efficient intervention models to improve children's early learning and development in remote areas.

In this quasi-experimental design, the outcomes of the intervention group (11 preschools) were measured and compared to a comparison group (11 preschools). The same schools from baseline (intervention and comparison schools) were selected for the endline. The preschools in the comparison group did not receive any intervention at all during the lifespan of the R.E. Learning project. Because they are in a different district in Pursat province, they did not receive any unintended impact from our intervention (positive spill-over effect from mass media or project result sharing activities). In the actual context, those preschools might have been exposed to some information about the intervention from other stakeholders through various sources, including mass media and outreach activities, which were beyond the control of the project. However, the estimation of selection bias, including the differences between comparison and intervention groups, is controlled by including control variables in difference-in-difference (DID) modelling.

Given the non-randomisation of the subjects to the intervention and comparison groups, there are potential threats to internal validity with this type of design, including selection bias. Differences in outcomes might be attributed to differences in the pre-schoolers, families, teachers, school management, and communities in the comparison and intervention groups. Therefore, the DID econometric technique is applied to control confounding variables and isolate the project's unique impact.

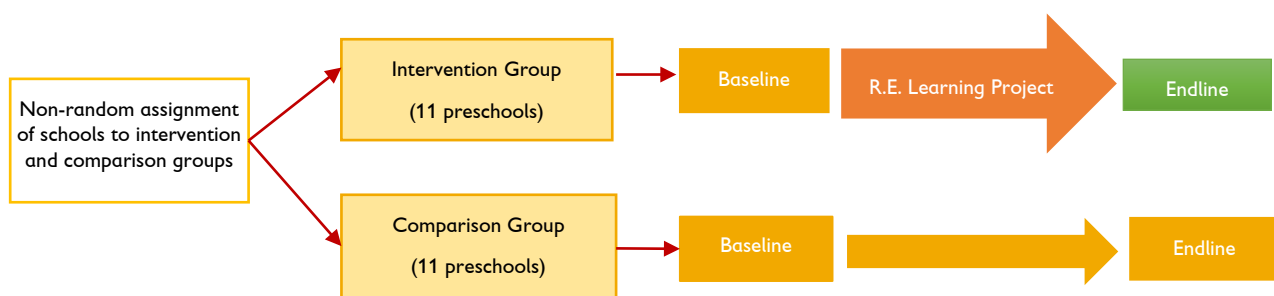


Figure 2-1. Impact evaluation using non-equivalent (pre-test and post-test) control-group design

2.2 METHODS OF EVALUATION

Surveys using the same tools from baseline were conducted with children, caregivers/parents, teachers, and school managers in the intervention and comparison groups. Data was structured in a way that allows for panel and multilevel analyses.

- 1) **International Development and Early Learning Assessment (IDELA)**¹ was used to observe and assess children's early learning and development through a series of games.
- 2) **IDELA-Home Environment (IDELA-HE)** tool was used in interviews with caregivers to assess key background characteristics (e.g. socioeconomic status, home learning materials) that influence child development.
- 3) **The Early Childhood Education (ECE)/IDELA Preschool Environment observation tool** is a rubric adopted by the Cambodian government to measure the quality of preschool physical environments and resources and preschool teacher classroom practices. The original government tool has 11 items, but six additional items were added from the IDELA Classroom Environment Tool to reflect the programmatic approach better.
- 4) **The Teacher Motivation Diagnostic Tool (TMDT)**² was developed through Save the Children's Literacy Boost program in partnership with World Vision to understand better the internal and external supports and challenges teachers face in low-income contexts regarding their beliefs, practices, environment, and receptivity to new ideas and techniques.
- 5) **The school director survey tool** is a short rubric form containing three questions about the extent of parental engagement in (a) interactions with preschool teachers, (b) capacity building and their role in child development, and (c) diverse early childhood care and development (ECCD) management committee.

In addition to quantitative data collection for the endline survey, we also conducted key informant interviews (KIIs) with selected key informants from both the intervention and the comparison groups, including two PoE officials, two DoE officials, six directors, six teachers and six parents. The data from these qualitative interviews were analysed using in-depth description or text analysis and used to support the findings of the quantitative analysis.

2.3 SAMPLING PROCEDURES

☒ Sample size

The sample sizes from baseline were replicated, and the same preschools from the intervention and comparison groups were selected for endline evaluation. The numbers of children in the samples were proportionate to the total number of children in the selected schools. We interviewed additional children and caregivers to ensure that we achieved the correct sample sizes. So, the actual samples of children and

¹ More information about IDELA can be found at <https://idela-network.org>

² More information about TMDT can be found at <http://www.teachermotivation.org/blog2/>

caregivers in the endline intervention (176) and the baseline intervention (176), and in the endline comparison (176) and the baseline comparison (176), were all the same size.

Table 2-1. Sample selection

Preschool Type	Intervention Group					Comparison Group				
	School	Children	Caregiver	Teacher	Director	School	Children	Caregiver	Teacher	Director
Attached Community	-	-	-	-	-	2	32	32	2	2
Attached State	7	112	112	7	7	8	128	128	8	8
Separate Community	3	48	48	3	3	1	16	16	1	1
Separate State	1	16	16	1	1	-	-	-	-	-
TOTAL	11	176	176	11	11	11	176	176	11	11

Note: There are two main types of preschools – state and community. State preschools come under the control of the Ministry of Youth, Education and Sport.

☒ Sampling strategy

Systematic sampling was used to select children at every Nth interval (total number of students in a school/sample size per school). Beside this, purposive sampling was employed to selection key informants for the interviews.

2.4 DATA COLLECTION

Three staff members from the Department of Early Childhood Education of the Ministry of Education, Youth and Sport (MoEYS) were co-facilitators along with MEAL (monitoring, evaluation, accountability, and learning) officials and technical staff. There were 16 (eight women) data collectors, nine participants from the Provincial Office of Education (PoE), three participants from the District Office of Education (DoE) and five provincial preschool teachers.

A five-day training on data collection using paper forms was conducted in January 2021 with facilitators from MoEYS and Save the Children. Role play during training and wrap-up question and answer sessions at the end of each training day ensured participants understood the contents and were able to collect high-quality data. At the end of the training, participants had the opportunity to practice using the tools they had learned about and find out more about actual data collection. During field practice, the facilitators observed each participant as closely as possible, watching how they asked each question, their behaviour, and the materials and methodology they used. At the end of the field practice, participants had the chance to ask the facilitators to clarify any concerns, and the facilitators provided feedback based on their observation.

☒ Field data collection

The data collection was conducted from 14 to 22 January 2021 in Veal Veng district and Phnom Kravanh district. Quality assurance was divided into several steps, as follows.

- Step 1: Each data collector checked their own completed questionnaires.

- Step 2: Data collectors were grouped into small teams with one supervisor (from PoE) and one deputy. Team supervisors helped coordinate arrangements for respondents, observed/monitored data collection and whether data collectors followed the correct procedure, and checked the completed questionnaires.
- Step 3: Quality control was undertaken by officials from MoEYS and Save the Children, including R.E. Learning project staff, Education Program staff and MEAL staff. They monitored data collection closely and checked all completed questionnaires.
- Step 4: Some feedback was given immediately to correct the procedure where necessary. Feedback was also given to each data collector at the end of the interviews. And every day, the facilitators and project staff provided feedback to the team they were supervising. We also created a channel on Telegram through which all data collectors, team supervisors, facilitators and project staff could raise issues, clarify concerns and suggest improvements.

After data collection was completed, data entry training using Kobo was provided to data entry staff. The data enterers entered the survey responses in the morning and then verified what they had entered in the afternoon. Data were cleaned daily.

2.5 VARIABLE MEASUREMENT

☒ International Development and Early Learning Assessment (IDELA)

According to Save the Children (2021), the IDELA is an easy-to-use, rigorous, global tool that measures children's early learning and development. It provides ECCD programs, donors and governments with clear evidence on the status of children from ages 3 to 5 years. Tasks are play-based and rely on locally sourced materials. IDELA contains four main domains, namely motor development, emergent literacy, emergent numeracy and social-emotional development. Each domain has several subdomains or subtests, as shown in Table 2-1 (see Annexe 2). Each subtest has many binary questions (1=correct, 0= incorrect). The domain scores are calculated as the percentage of correct questions in each domain.

Table 2-2 IDELA domains

Gross and fine motor development	Emergent literacy and language	Emergent numeracy	Social-emotional development
Hopping on one foot	Print awareness	Measurement and comparison	Peer relationships
Copying a shape	Expressive vocabulary	Classification/sorting	Emotional awareness and regulation
Drawing a human figure	Letter identification	Number identification	Empathy
Folding paper	Emergent writing	Shape identification	Self-awareness
	Phonemic awareness (first sound discrimination)	One-to-one correspondence	Conflict resolution
	Listening comprehension	Simple operations (addition and subtraction)	
		Simple problem solving (puzzle)	

Note: Executive function and approaches to learning items are NOT included in the total IDELA score.

☒ Home learning environment

The three main home learning environment domains used in this report are reading materials at home, learning toys at home, and caregiver's engagement with child's learning. These domains are measured by three sets of binary indicators (see Annexe 2). They are used as dependent variables in the DID impact models and dependent variables in the IDELA determinant models. When used as dependent variables, factor analyses were used to calculate the composite score of these domains, which were then rescaled to the scores from zero to 100. When used as independent variables, the combined score calculated from the factor analysis is categorised into three ordinal categories (low, medium and high) using three equal intervals (see Annexe 2).

☒ Preschool quality

Based on the Early Childhood Education/IDELA Preschool Environment observation tool, the main domains of preschool quality contain spaces and furnishing, language and reasoning, interactions, preschool curriculum structure, and teacher-parent conference, which are the higher domains of many indicators (see Annex 2). The composite scores of these domains are calculated by averaging the 4-point Likert scale, where 1 designates inadequate, 2 is minimal, 3 is good, and 4 is excellent. Factor analysis cannot be used due to the small sample size of 22 schools only. When they are used as independent variables in IDELA determinant models, these main domains are recoded as binary variables.

☒ Teacher motivation and confidence

Based on the TMDT, the variables for assessing teacher motivation include:

- Time spent on teaching activities such as preparing lessons in advance, correcting students' work, providing free remedial help to students outside school hours, exchanging ideas or getting help from colleagues at school, and communicating with parents or caregivers.
- Reasons for teaching such as enjoying school and my teachers and wanting to be like them, loving working with children and helping them learn and grow, loving the subjects I teach, believing in the importance of education, and wanting to help my community/country,
- Teaching absences are the number of working days on which the teacher is absent except for sick leave and training.
- Teacher beliefs including the level of satisfaction with a current teaching job, staying on after the preschool day to finish all their work rather than leaving early, giving extra help to students after preschool without expecting payment, sourcing and buying supplementary learning materials in their spare time using their own money, and pursuing further study and learning.
- The overall level of teacher motivation is derived from averaging the scores of the main variables.

Teacher confidence is a composite score of the following teacher beliefs:

- With all the experience I have, I can learn to improve my practice with very few new skills.
- I'm so overwhelmed with classroom challenges and following the curriculum that it is too difficult for me to try anything new.
- I do not manage stress well at all.
- I often feel unsuccessful as a teacher.
- Keeping students on-task is challenging.

These domains of teacher motivation and confidence entail simple summations of the scores, which is changed the scale to 0-100. Factor analysis cannot be used due to the small sample size of 22 teachers only.

2.6 DATA ANALYSIS FRAMEWORKS

The quasi-experimental design using multilevel longitudinal data required the application of t-test and DID modelling, taking into account pre-existing differences between the comparison and intervention groups and time trend and contextual effects. This robust design and analysis avoid the following potential errors. The result falsely finds that the project impacts the outcome in the case that the project does not. And when the project has an impact, the study finds no significant impact. Therefore, multilevel data analysis using DID model is an appropriate and rigorous impact evaluation method to attribute observed changes to the project's outcomes and impacts. Conventionally, the impact model can be expressed as the following formula:

$$\text{Impact (or difference-in-difference)} = (O_2 - O_1) - (O_4 - O_3) \pm \text{error}$$

- where: O_1 and O_2 = baseline and endline outcome measures, respectively, for the intervention group;
- O_3 and O_4 = baseline and endline outcome measures, respectively, for the comparison group;
- and error = design and measurement errors.

The difference-in-difference (DiD) method with random-effects and fixed-effects models

DID econometric modelling was used to identify the impact of the intervention on early learning and development and children's home learning environments and the determining factors of children's education and development outcomes. DID compares variations in outcomes over time between children or caregivers under the R.E. Learning project (the intervention group) and those who did not benefit from the R.E. Learning project (the comparison group). It lets us correct any differences between the intervention and comparison groups that were constant over time. DID comprises a before-after comparison for the intervention and comparison groups. It is a mixture of (1) a cross-sectional comparison that compares a sample in the intervention group to a sample in the comparison group and (2) a before-after comparison that compares the intervention group with itself before and after the intervention. We conducted three DID model analyses: the IDELA impacts model, the home environment impact model, and the IDELA determinant model. Annexe 2 details all the variables in this model.

The difference-in-difference equation

The DID model we used to estimate the effects of the intervention is shown in the equation below:

$$Y = \alpha + \beta_1 \text{Experiment} + \beta_2 \text{Time} + \beta_3 \text{Experiment} * \text{Time} + \beta_4 X + \varepsilon \quad (1)$$

- Where Y is the dependent variable, which comprise the scores for the four IDELA domains (motor development, emergent literacy, emergent numeracy, socioemotional development) and the overall IDELA score, and the scores for the three home learning environment domains (learning materials, learning toys, caregiver's engagement with children's learning at home) and the overall home learning environment score,

- *Experiment* is an “intervention” dummy variable indicating whether the samples are in the intervention group. This variable takes 1 when the unit of analysis is in the intervention group and 0 otherwise.
- *Time* is a dummy variable for survey sampling after R.E. Learning project implementation. This variable takes the value of 1 when the survey is endline and 0 otherwise.
- *X* is a set of covariates controlling for other factors such as socioeconomic characteristics. See the list of these variables in Annexe 2.
- The interaction term *Experiment * Time* is the DID estimator representing the difference between the pre- and post-test values of the dependent variables of those involved in the R.E. Learning project and those not involved in the project.

DID econometric modelling can only determine the project impact on children’s education and development and home learning environment. We cannot use DID econometric modelling to estimate the project’s effect on the preschool quality and teacher motivation because the sample size of preschools and teachers is pretty small. Instead, we use t-tests to identify the project’s impacts on the preschool quality and teacher motivation.

The random-effects and fixed-effects models

Random-effects and fixed-effects models are used in addition to the DID model. Statistical analysis is more complex when project participants are selected from naturally occurring intact groups (such as schools). Whole groups are selected for the comparison and intervention groups and not individuals (children), as is the case for impact evaluation of the R.E Learning project. Therefore, the random-effects and fixed-effects models are used in addition to the DID model. The random-effects model allows the inclusion of entire groups (clusters) within a model. Each cluster is given its random intercept made up of its mean and residual variance, meaning that each group has a different or random intercept. Intraclass correlation is a ratio that indicates the percent of the variation in the outcome that is attributed to the group. It represents between-group differences. The fixed-effects model allows the inclusion of a dummy variable that controls for group-level effects.

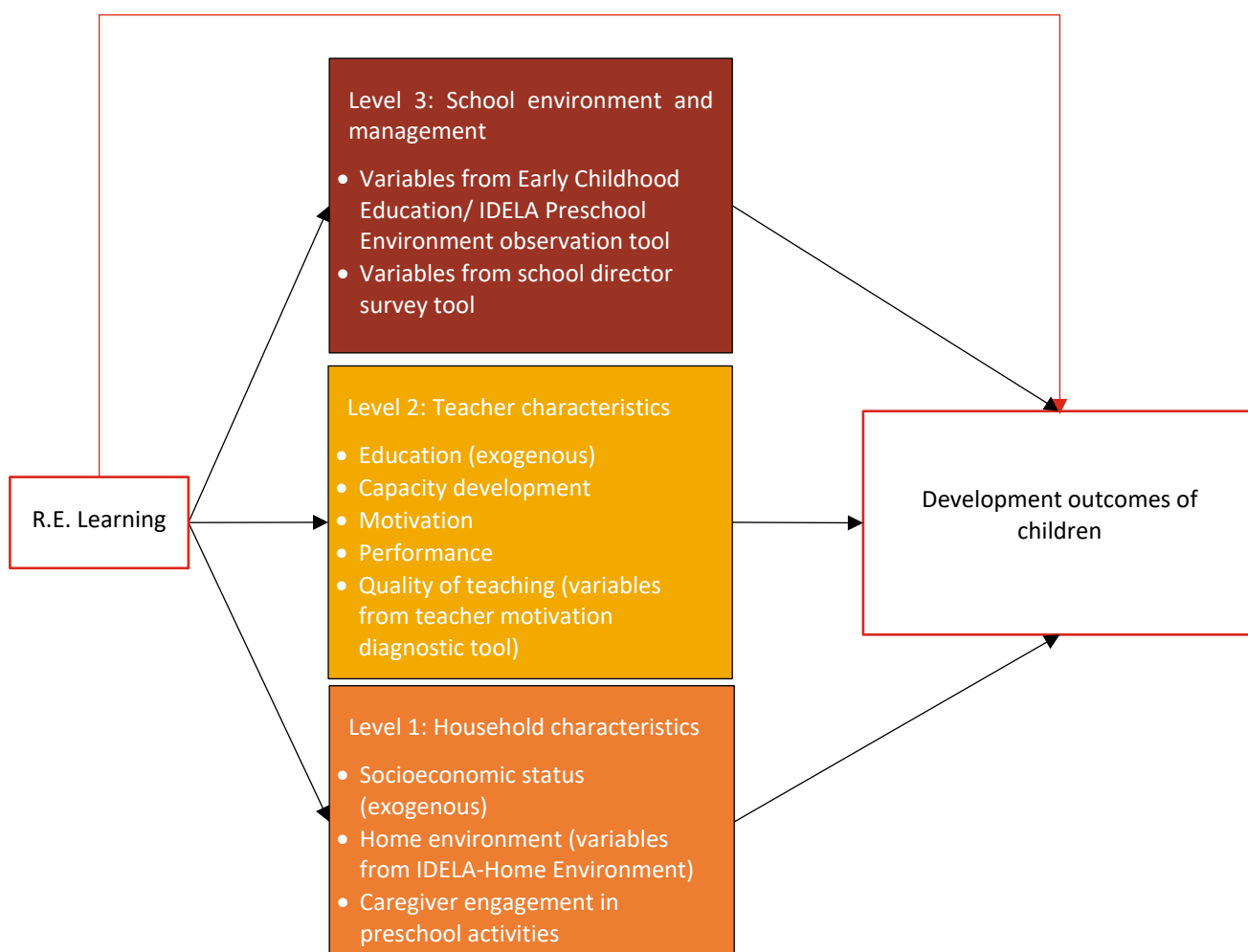


Figure 2-2. Conceptual framework for the factors influencing development outcomes of children aged 3-5 years under the R.E. Learning project

2.7 ETHICAL CONSIDERATIONS

The information sheet and consent form were written in Khmer. Field researchers gave a copy of the consent form to every respondent to read before the interview and asked respondents if they had any questions. If a respondent could not read, the field researcher read the information sheet and consent form during the consent process.

Additional preparation was required for children with specific disabilities to ensure their voices were heard. Human-subject research protocols were adhered to for all children, including oral permission from the child and verbal/written consent from the child's caregiver. All consultants and field researchers were trained on Save the Children's Child Safeguarding Policy and asked to sign to confirm their understanding and agreement with the policy and data protection awareness. No child was interviewed out of sight of their parents or guardian but in an environment where they could feel comfortable talking without fear.

2.8 LIMITATIONS OF EVALUATION DESIGN

The main limitation of this evaluation is that the sample sizes of children and caregivers for the baseline and endline surveys are not the same. The surveys targeted children between 3 to 5 years old attending the intervention and comparison preschools at the time of data collection. The caregiver sample comprises the parents or guardians of the targeted children. So, we cannot create panel data for children and caregivers, a standard format for DID and other causal inference models such as propensity score matching. To cope with this problem, we performed DID estimation using the long dataset format.

3 RESULTS

This section presents the evaluation results regarding the impacts of the R.E. Learning project on child learning and development, determinants of child learning and development, home learning environment, classroom quality, and teacher motivation. T-tests were conducted to compare the scores of the comparison and intervention groups and in the baseline and endline surveys. Although t-test results can verify the differences between the intervention and comparison groups and between endline and baseline, we cannot confirm that the differences are attributable to the R.E. Learning project. However, DID modelling controls for confounding factors/variables and can verify whether the project caused the differences.

3.1 CHILDREN'S LEARNING AND DEVELOPMENT OUTCOMES

This subsection addresses the following evaluation question: What is the effect of the intervention on the early learning and development of targeted children measured through the average IDELA scores? IDELA was used to measure children's early learning and development outcomes using direct observations through a series of games.

3.1.1 Overall children's learning and development

Differences between the intervention and comparison groups overtime

The differences in total IDELA scores between the intervention and comparison groups in the baseline and the endline surveys are shown in Figure 3-1 and Table A3-1.

- a) The intervention scores rose sharply from 60.6 in the baseline to 87.8 in the endline survey (difference = 27.2).
- b) The intervention group score was much higher than the comparison group (difference = 28.2) in the endline survey.
- c) In the baseline survey, there was no difference between the intervention and comparison groups (difference = -0.7).
- d) In the endline survey, the comparison group's score did not improve (difference = -1.8).

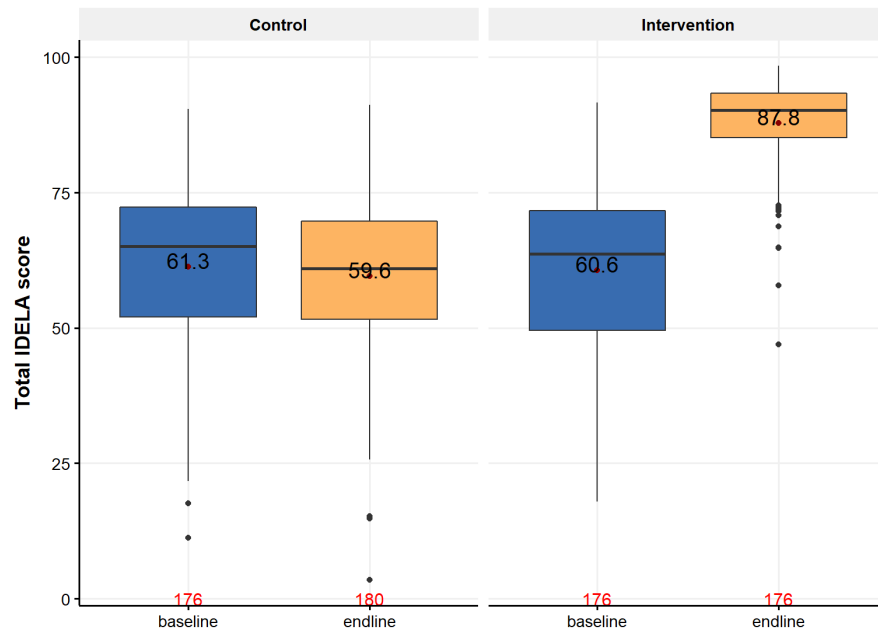


Figure 3-1. Differences in total IDELA scores

Project impacts

This subsection discusses the DID econometric analyses to determine the effects of the R.E. Learning project on young children's learning and development, as measured by the scores for the four IDELA domains (i.e. motor development, emergent literacy, emergent numeracy, and social-emotional development) and the overall IDELA score. So, DID modelling was performed five times. Although many variables have statistically significant effects on the outcome variables in the models (Annexe 4), these variables are not reported and discussed in this section. Hence, the parameter of interest in the models is the interaction between time and experiment for measuring changes in children's learning and development outcomes resultant of the R.E. Learning project. We also drew on the KIIs to provide further qualitative explanations for these quantitative results where possible.

Annexe 4 shows the result of the DID model for the project impacts on child learning and development. The R.E. Learning project has a significant effect on children's overall IDELA scores in the intervention group ($\beta = 26.538^{***}$). The total IDELA scores of children in the intervention group increased by around 26.5 percent after the R.E. Learning project implementation.



Figure 3-2. Activity 1.3.2: Conducting training for preschool teachers and primary school principals on quality learning and teaching activities

Photo taken by the project team on 11 November 2019

3.1.2 Motor development

Differences between the intervention and comparison groups overtime

The t-test result for the difference in motor development (Figure 3-3; Table A3-2) shows that:

- The motor development of children in the intervention group increased significantly from 67.2 in the baseline to 89.2 in the endline survey, a difference of 22 percent.
- In the endline survey, the intervention group's score of 25.7 percent was higher than that of the comparison group.
- In the baseline survey, the difference was no significant in motor development between children in the intervention and comparison groups (difference = 0.7).
- There was no significant difference in the motor development of the comparison group between the baseline and endline surveys (difference = -3).

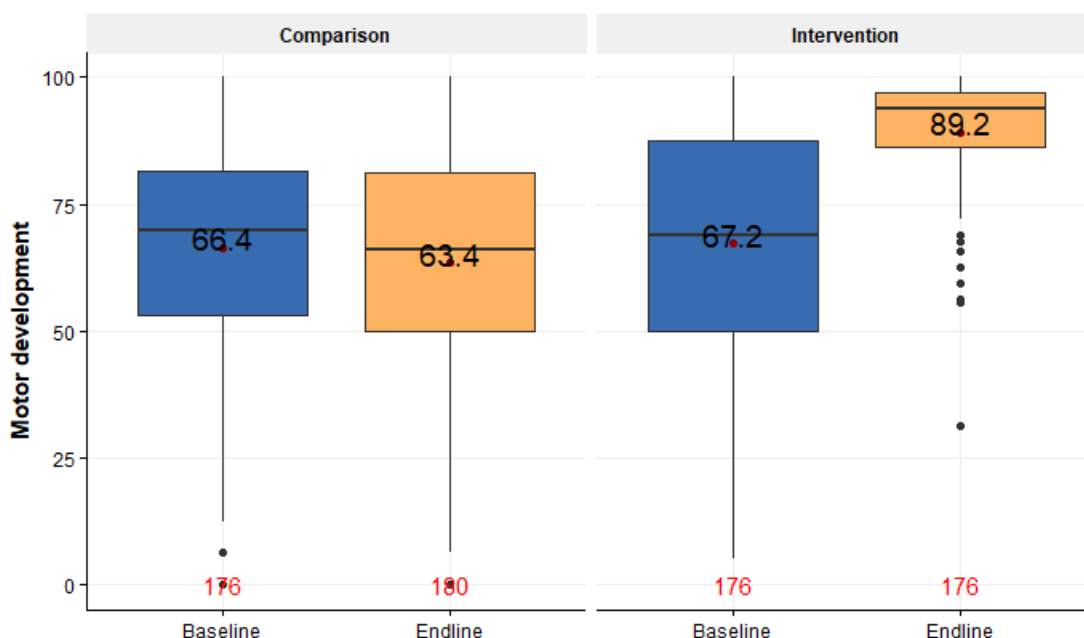


Figure 3-3. Differences in motor development domain

Project impacts

The R.E. Learning project significantly affects children's motor development ($\beta = 19.290^{***}$). The motor development of children in the intervention group increased by around 19.3 percent after the R.E. Learning project implementation. Nonetheless, this effect is the most minor compared to other domains of child learning and development.

The relatively minor project impact on motor skill development can be attributed to the effects of the Covid-19 pandemic, which precluded the project from achieving its goal to improve children's motor skill development in the school setting. Children did not have the chance to develop their gross motor skills because they could not use the school playgrounds and toys due to social distancing rules. Some respondents had similar thoughts; as PoE respondent put it:

The Covid-19 pandemic was found to have an impact on children's learning outcomes and development.... Children did not play together as much as before when they were at school due to social distancing. This means that they were not as active as before. PoE respondent ID 10



Figure 3-4. A preschool play round

Photo taken by the consultant on 6 February 2021

3.1.3 Emergent literacy

Differences between the intervention and comparison groups overtime

The differences in emergent literacy scores between the intervention and comparison groups in the baseline and the endline surveys are shown in Figure 3-5 and Table A3-3.

- The intervention group's score sharply rose from 44.4 in the baseline to 79.9 in the endline survey (difference = 35.5).
- In the endline survey, the score of the intervention group was much higher than that of the comparison group (difference = 43.3).
- In the baseline survey, there was no significant difference between the comparison and intervention groups (difference = -0.9).
- The comparison group's score decreased significantly from 45.3 in the baseline to 36.6 in the endline survey (difference = -8.7).

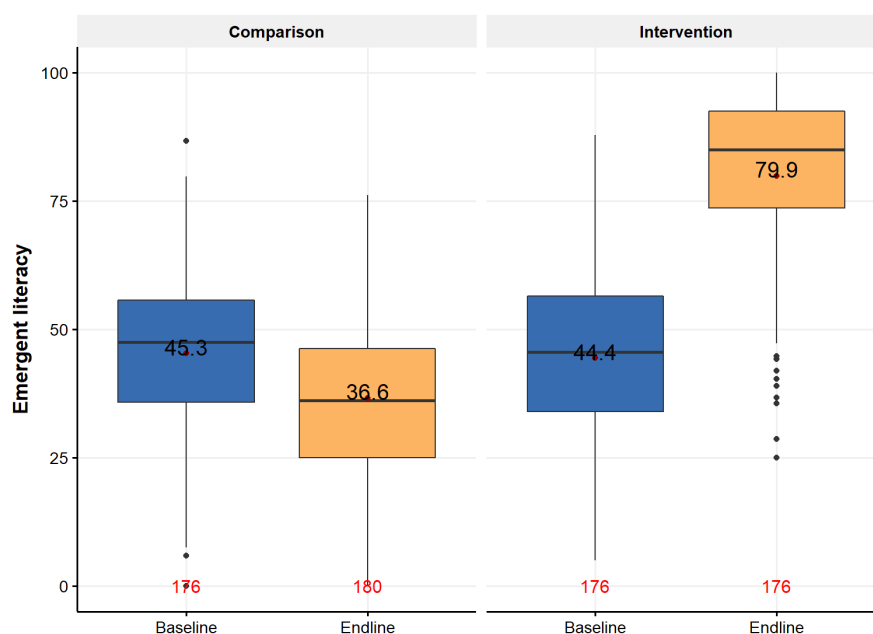


Figure 3-5. Differences in emergent literacy domain

Project impacts

The R.E. Learning project has a significant positive effect on children's emergent literacy score ($\beta = 41.410^{***}$) (Annexe 4), the most noticeable impact compared to other domains, suggesting that the emergent literacy score of children in the intervention group increased by 41.4 percent between baseline and endline survey.

One explanation for the R.E. Learning project's significant positive impact on emergent literacy development is its provision of professional development and support through training, mentoring and coaching, and exposure to emergent literacy and maths skills play-based learning. Before this project, teachers had few chances to receive such training and mentoring. Now, it is expected that the target schools can improve the emergent literacy development of young children. The following statements confirm the differences, including in the emergent literacy development of children, in the target schools before and after project implementation:

The differences after project implementation are motor development: children can do more activities or play more with their friends in school; emergent literacy: they can repeat or draw letters; emergent numeracy: they can count numbers; social-emotional development: children comfort their friends when they cry or fall, and other improvements: they also share study materials or toys with each other. DoE Respondent ID 21

In the last three years, we have observed a difference in the educational and developmental outcomes of children aged 3 to 5 years; that is, they are more courageous and have improved their emergent literacy. Children have good relationships with friends and teachers and have good morals. Girls are braver than boys, and girls go to school more regularly than boys. Most of the girls are smart. DoE respondent ID 21



Figure 3-6. Activity 1.3.4: Promote peer to peer professional support, resource sharing and problem-solving through preschool cluster meetings

Photo taken by the project team on 26 November 2019

3.1.4 Emergent numeracy

Differences between the intervention and comparison groups overtime

The differences in emergent numeracy scores between the intervention and comparison groups in the baseline and the endline surveys are shown in Figure 3-7 and Table A3-4.

- a) The intervention group's score increased sharply from 46.3 in the baseline to 89.5 in the endline survey (difference = 43.3).
- b) The intervention group's score was much higher than the comparison group's score (difference = 37.3) in the endline survey.
- c) In the baseline survey, there was no difference between the intervention and the comparison groups (difference = 1).
- d) The emergent numeracy score of children in the comparison group increased from 45.2 in the baseline to 52.2 in the endline survey (difference = 7.0).

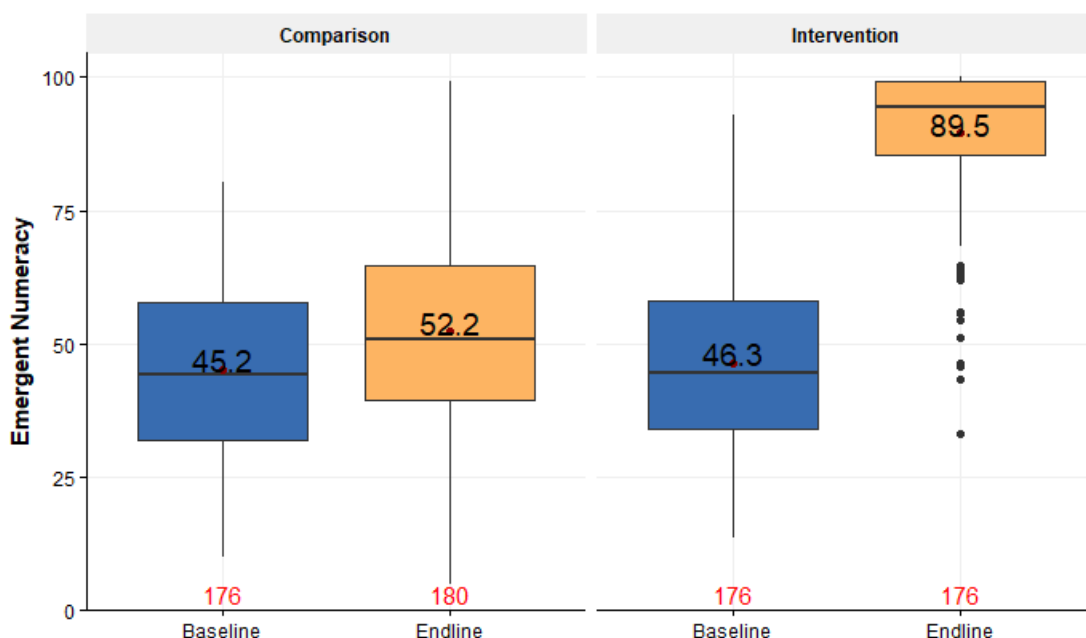


Figure 3-7. Differences in emergent numeracy domain

Project impacts

The results show that the R.E. Learning project has a significant effect on children's emergent numeracy scores ($\beta = 31.595^{***}$) (Annexe 4), indicating that the emergent literacy scores of children in the intervention group increased by 31.6 percent as a result of the R.E. Learning project.

3.1.5 Socioemotional development

Differences between the intervention and comparison groups overtime

The differences in the socio-emotional development scores between the intervention and comparison groups in the baseline and the endline surveys are shown in Figure 3-8 and Table A3-5.

- The intervention group's score rose sharply from 50.2 in the baseline to 83.4 in the endline survey (difference = 33.2).
- The intervention group's score was higher than that of the comparison group in the endline survey (difference = 33.1).
- In the baseline survey, there was no significant difference between the intervention and comparison groups (difference = -2.8).
- In the endline survey, the comparison group's score was not significantly different from that in the baseline survey (difference = -2.6).

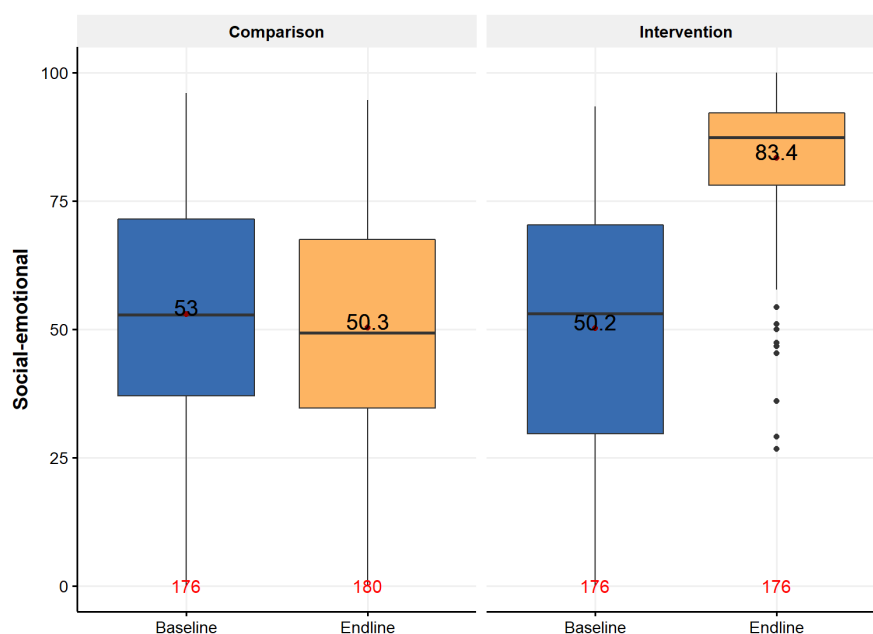


Figure 3-8. Differences in socio-emotional domain

Project impacts

The R.E. Learning project significantly positively affected children's socio-emotional development in the intervention group ($\beta = 29.117^{***}$) (Annexe 4). The socio-emotional development scores of children in the intervention group increased by around 29.1 percent after project implementation.

Improvements in teacher quality through capacity development, mentoring and coaching, peer to peer professional support, resource sharing, and problem-solving through (twice monthly) preschool cluster meetings can explain the R.E. Learning project's significant positive impact. The majority of respondents agreed that children's socio-emotional development in the target schools had improved in various aspects. The following statements highlight their agreement.

There are some notable differences after the implementation of this project. There is the development of emotions and social relationships. For example, when there is a problem, students tell the teacher, or they know how to say sorry, share, and play in groups of 3 to 4 children. Teacher respondent ID 7

I have observed some changes since the implementation of this project. Those changes include: 1) improvements in my positive behaviour towards management (up to 60 percent), improving friendly attitudes among children by being able to guide their play, knowing how to actively connect children, encouraging children's physical development, being a role model for children such as saying sorry when I've done something wrong.... Children know how to comfort each other when they run and hit their friends, and they know how to play together. Teacher respondent ID 3

3.1.6 Determinant factors of children development outcomes

This subsection addresses the following evaluation question: What factors (household socioeconomic characteristics, home environment, classroom quality, and teacher motivational factors) are related to children's developmental outcomes?

Children's characteristics

Annexe 5 details five factors of children's characteristics associated with child learning and development, including age, gender (as a girl), school attendance, and time spent in preschool. Children's age is likely to affect their overall learning and development positively. Children are likely to have higher scores across all IDELA domains than children who are just one year younger. This result suggests that for every year increase in age, children's learning and development increase by around 4.5 percent across all domains except for motor development, which increases by 9.1 percent.

Girls have higher learning outcomes in all domains. Overall, the learning and development outcomes of girls are 2.4 percent higher than that of boys. Disaggregated by the four domains, girls' motor development score is 3.1 percent higher than that of boys, literacy score 3.5 percent higher, numeracy score 0.6 percent higher, and socio-emotional development score 4.4 percent higher. A study conducted by Eriksson et al. (2012) to determine the differences between girls and boys in emergent literacy skills reveals that girls progress slightly faster than boys in learning vocabulary and combining words, which increases with age. Therefore, it is not a surprise that we can see the significant positive relationship of female children on emergent literacy. We can say that females have the propensity to display their emotions more openly than males due to culture. This finding is also consistent with other studies, including a study by Save the Children in Vietnam (Save the Children n.d) which finds that culture may be one reason boys show less socio-emotion. Several education staff respondents also observed some differences between the learning outcomes of girls and boys.

*Female students are better than male students. Male students do not focus much on studying.
Deputy director respondent ID 16*

For the last three years, children between the ages of 3 and 5 years have had different educational and developmental outcomes. Girls are more understanding and have better attitudes both in class and in school activities than boys. Teacher respondent ID 12

*Girls are bolder than boys, and they go to school more regularly than boys. Most girls are smart.
DoE respondent ID 11*

School attendance also played a significant role in improving children's learning and development outcomes. Children who attend school regularly are likely to increase their overall learning and development by 3.8 percent, motor development by 7 percent and numeracy by 3.6 percent.

Time spent in preschool also contributes significantly to children's learning and development outcomes. For example, at least one year of pre-schooling can increase a child's overall learning and development by 4.6 percent, motor development by 4.4 percent, literacy by 3.4 percent and numeracy by 5.4 percent.

Household characteristics

The number of children in the family has a negative relationship with socio-emotional development. For example, suppose the number of children in the family increases by one, the socio-emotional development of the other children might decrease by 1.5 percent.

Home learning environment

The home learning environment consists of three main domains – reading materials, learning toys, and parental/caregiver engagement with child learning (see Annexe 2 for more details).

Reading materials and parental/caregiver engagement with their children's learning consistently positively affects most children's learning and development domains. Children in a family with a medium quantity of reading materials have between 3.5 percent to 6 percent higher scores in all IDELA domains than children in a family with a low amount of reading materials. In addition, the socio-emotional development of children in a family with a high quantity of reading materials is 6.3 percent higher than that of children in a family with a low amount of reading materials.

A moderate level of parental/caregiver engagement in children's learning at home might increase overall learning and development by 5.6 percent, motor development by 8.7 percent, literacy by 4.9 percent and numeracy by 5.1 percent. A high level of parental/caregiver engagement would bring about similar increases in overall learning and development (5.5 percent) and motor development (8.7 percent), but slightly higher increases in literacy (6 percent) and numeracy (6.7 percent). However, having learning toys at home does not positively affect children's learning and development.

The significant positive relationship of these variables can be explained by the fact that it is difficult for children to develop basic skills without a conducive home learning environment. For example, the attitude of parents/caregivers is essential in helping children develop these skills. Without such support at home, children will only have a chance to develop those skills at school, which may not be enough. One parent mentioned that:

My home learning environment has changed for three years. I have added more learning materials for my children. As a result, they have become more clever, bolder and intend to help with the housework after their studies. Parent respondent ID 17

School environment and teacher characteristics

Five domains are used to measure the school environment; they are spaces and furnishing, language and reasoning, interactions, preschool curriculum structure, and parent-teacher relationships (see Annex 2). Three variables of the school environment have a significant positive relationship with children's development outcomes. Those variables are interactions (teacher/caregiver-children), preschool curriculum structure, and space and furnishing. Good quality interaction can raise overall learning and development by 11.1 percent, motor development by 10.5 percent, literacy by 18.4 percent, numeracy by 10 percent and socio-emotional development by 12.2 percent. Good quality preschool curriculum can lift children's overall learning and development by 8 percent, literacy by 14.1 percent and numeracy by 8.3 percent. Good space and furnishing can boost children's numeracy by 12.5 percent.

As a part of the preschool curriculum structure, some education staff claimed that teacher training, Thursday meetings and colleagues help teachers to prepare effective lesson plans and try out new teaching methods because they can learn new teaching methods, exchange ideas, and improve their weaknesses.

The technical meeting on Thursdays has helped teachers prepare effective lesson plans and teaching materials and raise and resolve issues from the previous week. Teachers can exchange their ideas, experiences and teaching methods with colleagues, better understand preschool children's learning and experience from listening to senior teachers and improve their lesson plans and preschool curriculum structure accordingly. Deputy Director of DoE respondent ID 1

In terms of spaces and furnishing, most survey respondents opined that a classroom that offers a suitable environment and is fully equipped with study materials, teaching aids and educational displays would benefit children's learning outcomes and encourage dynamic class activities. Good classroom quality is a factor that enables children to focus on learning activities, while a clean, fresh classroom environment is motivating for teachers and conducive to positive teacher-student and student-student interactions,

making learning enjoyable. A classroom as a caring place should be built to meet teachers' teaching and learning demands and children of different preschool levels.

Classroom quality is relevant because if the room is not clean, students do not want to study, but it will make students like it if the classroom looks clean and attractive. Deputy Director of DoE respondent ID 1

Teacher variables that affect children's learning and development at preschool are the number of working days on which the teacher was absent in the previous week, teacher confidence, type of preschool teacher, experience in the current school, teacher work experience, and teacher age.

The result indicates that if a teacher is absent for one day a week, children's overall learning and development, literacy and numeracy will decline by 2 percent, 3.3 percent and 2.9 percent, respectively. Whether moderate or strong, teacher confidence is likely to have a negative effect on children's learning and development. This could suggest that teacher confidence alone is not enough to improve children's learning and development outcomes. It should be accompanied by other factors such as teaching quality and capacity.

As expected, children learning with a formal teacher may have much higher learning and development outcomes than children learning with a community teacher. In addition, teacher experience in the current school makes a slightly positive contribution to children's learning and development, whereas teacher work experience has a somewhat negative effect on children's learning and development. Finally, older teachers were likely to teach children better.

3.2 HOME LEARNING ENVIRONMENTS

This subsection presents and discusses the impact analysis findings on the effects of the R.E. Learning project on the home learning environment. It addresses the following evaluation question: What is the impact of the intervention on targeted children's home learning environments?

The home learning environment consists of three main domains – reading materials, learning toys, and parental/caregiver engagement with child's learning at home (see Annexe 2 for more details). In this sector, the composite scores of these domains are rescaled to 0-100.

T-tests were conducted to compare home learning environments between children in the comparison and intervention groups before and after project implementation. Although the t-test results can verify the differences between the intervention and comparison groups over time, we cannot confirm that the differences are attributable to the R.E. Learning project. However, DID econometric modelling can identify the R.E. Learning project's impacts on key dimensions of the home learning environment, including the overall home learning environment, reading materials at home, learning toys, and caregiver engagement with children's learning at home.

3.2.1 The overall home learning environment

Differences between the intervention and comparison groups overtime

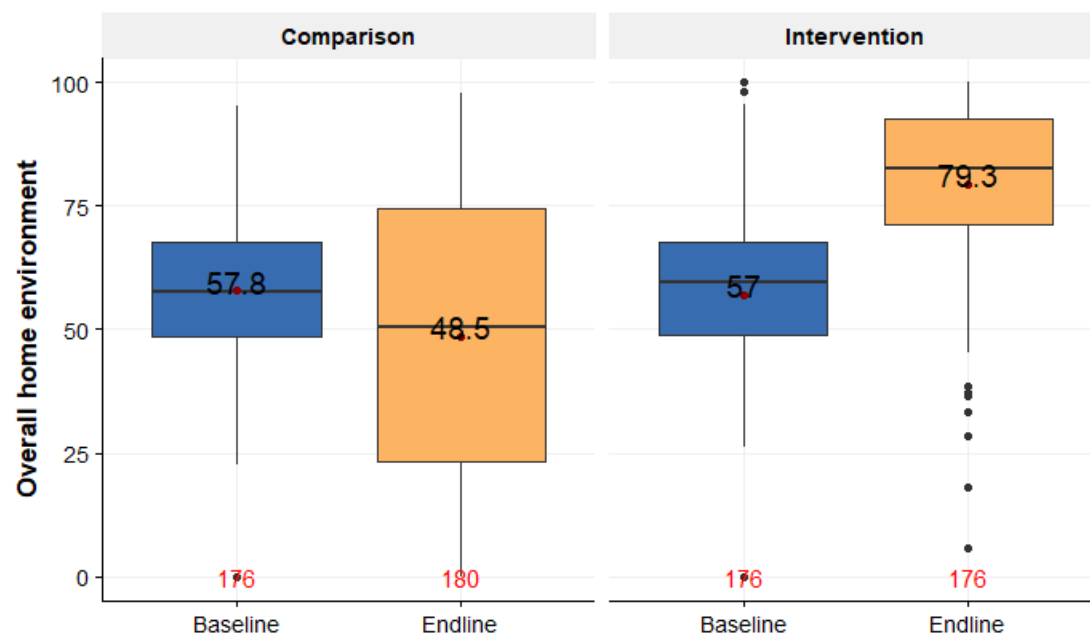


Figure 3-9 and Table A6-1 detail the differences in the overall home learning environment scores between the intervention and comparison groups in the baseline and the endline surveys.

- The score of the intervention group increased from 57 in the baseline to 79.3 in the endline surveys (difference = 22.3).
- The score of the intervention group was significantly higher than the comparison group (difference = 30.8) in the endline survey.
- In the baseline survey, there was no significant difference between the intervention and comparison groups (difference = -0.9).
- The score of the comparison group decreased from 57.8 in the baseline to 48.5 in the endline survey (difference = -9.4).

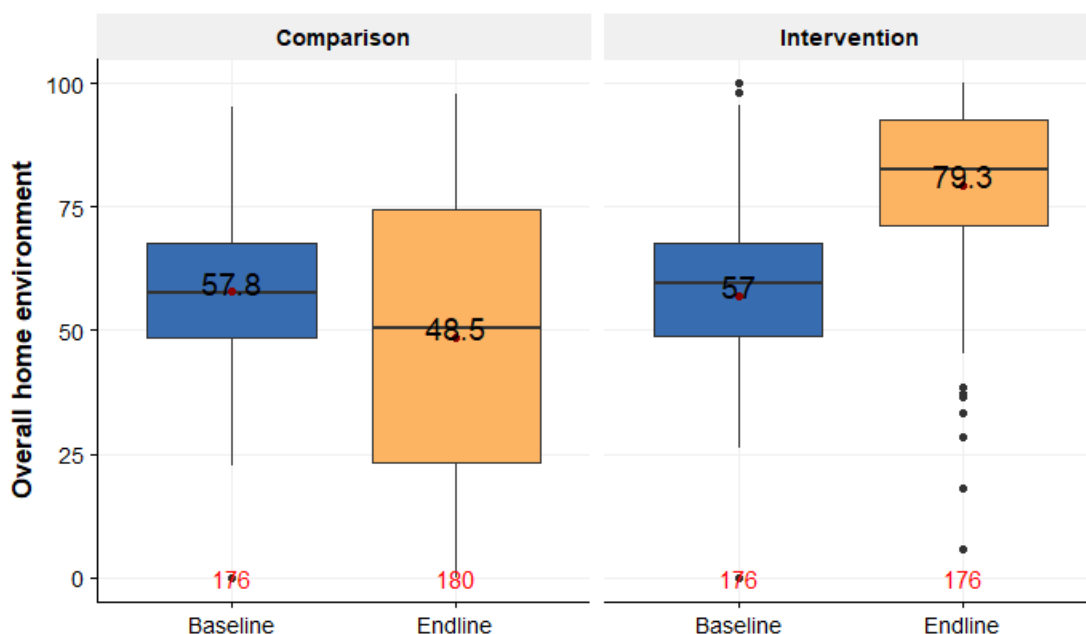


Figure 3-9. Differences in overall home learning environment

Project impacts

Annexe 7 shows the result of the DID model for the project impacts on the home learning environment. The R.E. Learning project has a significantly positive effect on total scores of the home learning environment in the intervention group ($\beta = 25.457^{***}$) (Annexe 7). This means that households in the intervention group had increased their overall home learning environment score by around 25.5 percent since the baseline survey as a result of the R.E. Learning project.

The KII respondents cited that Save the Children International (SCI) equipped parents/caregivers in the intervention group with learning materials such as books, toys, masks and desks; these aids enable them to be more engaged with their children's learning at home. SCI also encouraged parent/caregiver-teacher communication. Moreover, through supporting their children's learning at home, parents/caregivers can establish intimate relationships with their children by understanding their learning progress and problems. When parents/caregivers understand the importance of early learning education, they put more effort into educating their children at home. Improvements in parent-child communication help parents interact better with their children in various learning activities at school and home. Better interactions between parents and their young children at home are the foundation of a good home learning environment

3.2.2 Reading materials at home

Differences between the intervention and comparison groups overtime

The differences in the home reading materials scores between the intervention and comparison groups in the baseline and the endline surveys are shown in Figure 3-10 and Table A6-2.

- Households in the intervention group increased their home reading materials by 33.5, from 13 percent in the baseline survey to 46.5 in the endline survey.

- b) In the endline survey, households in the intervention group had a reading materials score of 28.2, which was higher than that of the comparison group.
- c) In the baseline survey, there was no significant difference in the reading materials at home between the intervention and comparison groups (difference = 1.8).
- d) In the endline survey, the comparison group's reading materials at home had changed significantly (difference = 7.1).

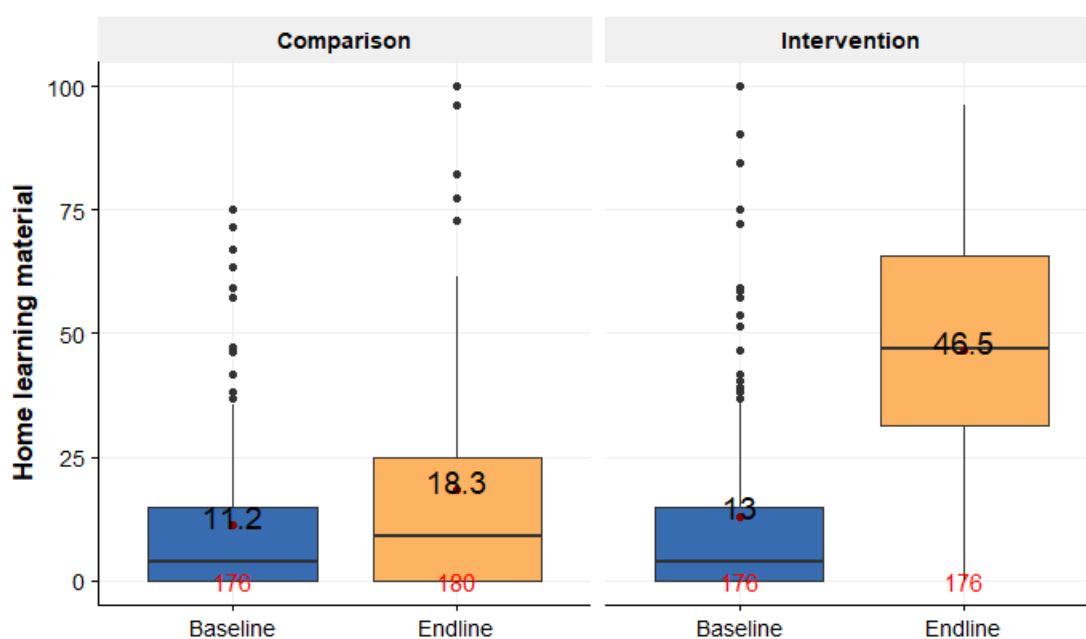


Figure 3-10. Differences in reading materials at home

Project impacts

The R.E. Learning project significantly impacts reading materials at home in the intervention group ($\beta = 22.428^{***}$) (Annexe 7). After implementing the R.E. Learning project, households in the intervention group increased their reading materials at home by around 22.4 percent.

The DID result can be best explained by the fact that parents/caregivers made changes in their home learning environment over the last three years. In the past, children did not have enough study materials or facilities for learning. Now, because of the R.E. Learning project, they have more study materials such as books, toys and desks. Some respondents claimed that parents/caregivers could teach their children more at home using the reading materials provided by the project.

The organisation provided many books, toys, bags, masks and tables. There are proper study materials at home. Parent respondent ID 6

With more reading materials from the project, parents or caregivers can teach their children more at home, mainly teaching letters. Deputy director ID 16

Moreover, to enable children to continue studying during the Covid-19 pandemic, the R.E. Learning project provided textbooks so that parents/caregivers could teach their children at home. This was based on the DoE's statement, as shown below.

The Covid-19 pandemic has been a profound setback for children's learning outcomes, but the partners copied the textbook for parents to teach their children at home so that children's learning outcomes will not be affected as much as initially thought. DoE respondent ID 1

Some parents form intimate relationships with their children through understanding their learning progress and problems when they teach them at home. One parent mentioned the organisation's support in providing a child with textbooks, pictures, toys and other learning materials. Other parents seemed to understand the learning needs of children at home because they had received general advice and information on children's education and development.

The study environment has improved. Parents are motivated to have good relationships with their children when they teach them at home. Parent respondent ID 13

3.2.3 Learning toys at home

Differences between the intervention and comparison groups overtime

The differences between the intervention and comparison groups regarding learning toys at home in the baseline and endline surveys are shown in Figure 3-11 and Table A6-3.

- a) Households in the intervention group had more learning toys at home in the endline survey than in the baseline survey, with an increase from 69.6 to 82.2 (difference = 12.6).
- b) In the endline survey, households in the intervention group had 31.9 percent more learning toys at home than those in the comparison group.
- c) There was no significant difference in learning toys in the baseline survey between the intervention and comparison groups (difference = -1.7).
- d) In the endline survey, households in the comparison group had significantly fewer learning toys at home than in the baseline survey, with a decrease from 71.3 to 50.3 (difference = -21).

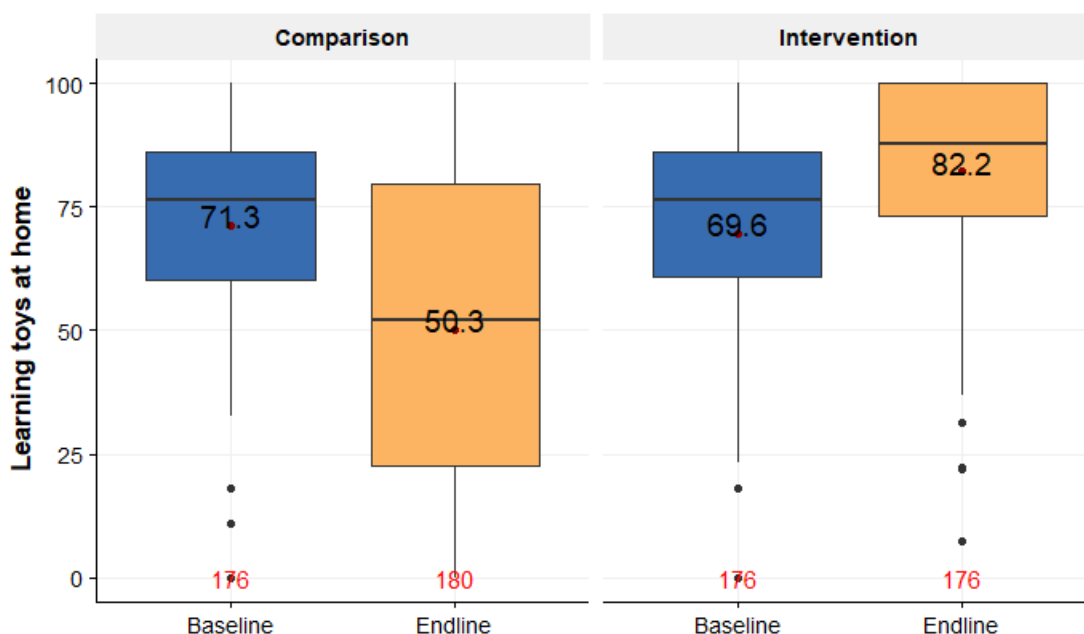


Figure 3-11. Differences in learning toys at home

Project impacts

The R.E. Learning project significantly affects learning toys at home in the intervention children's households ($\beta=27.021^{***}$) (Annexe 7). This means that after the R.E. Learning project implementation, families in the intervention group increased their learning toys at home by around 25 percent from the baseline. The increase in learning toys at home is also due to the project's support. Some parents claimed that parents/caregivers could teach their children better at home owing to the reading materials provided by the project.

3.2.4 Parental/caregiver engagement with children's learning at home

Differences between the intervention and comparison groups overtime

The differences in parental/caregiver engagement with children's learning at home between the intervention and comparison groups in the baseline and the endline surveys are shown in Figure 3-12 and Table A6-4.

- In intervention group households, parental/caregiver engagement with children's learning at home increased from 66.1 in the baseline survey to 85.8 in the endline survey (difference = 19.7).
- In the endline survey, the level of parental/caregiver engagement with children's learning at home was higher in the intervention group than in the comparison group (difference = 25.4).
- In the baseline survey, there was no significant difference between the level of parental/caregiver engagement with children's learning at home in the intervention and comparison groups (difference = -1.7).

- In comparison group households, the level of parental/caregiver engagement with children's learning at home had decreased significantly in the endline survey (difference = -7.4).

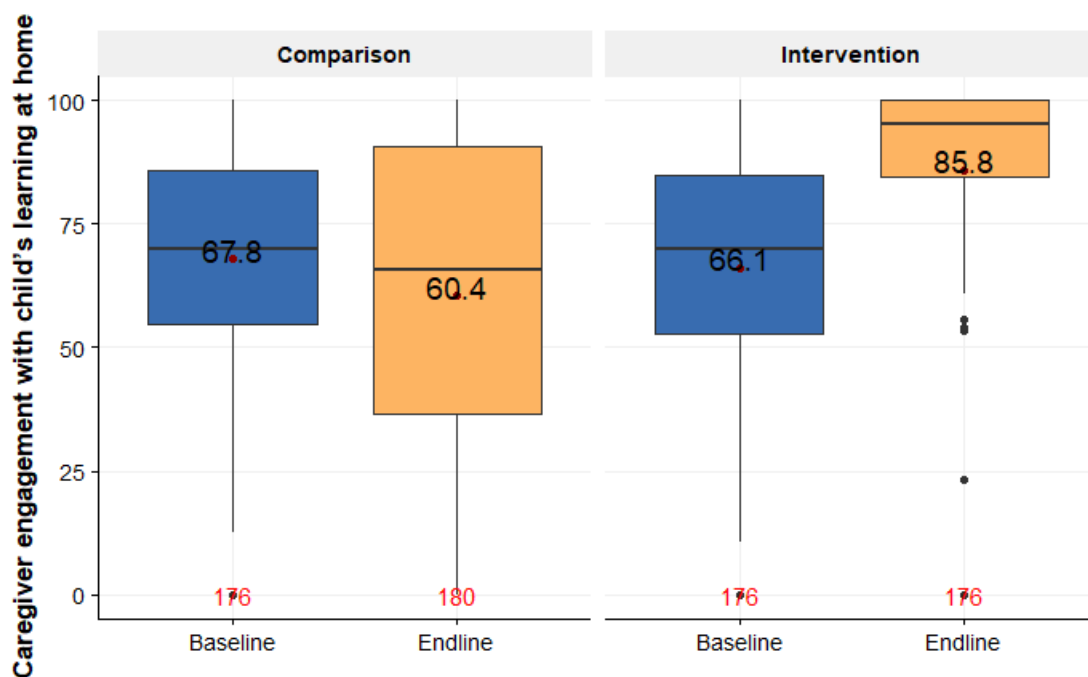


Figure 3-12. Differences in parental/caregiver engagement with children's learning at home

Project impacts

For households in the intervention group, the R.E. Learning project significantly positively affected parental/caregiver engagement with children's learning at home ($\beta = 22.428^{***}$) (Annexe 7). This suggests that as a result of the R.E. Learning project, the intervention households increased parental/caregiver engagement with children's learning at home by around 16 percent compared to the baseline survey.

This result can be explained by the fact that parents in the intervention group stressed the importance of communication with teachers and other preschool staff after the R.E. Learning project was implemented. Improvements in parent-teacher communication help parents better interact with their children in various learning activities at school and home. Because of the good communication with teachers, parents are informed about their children's learning activities or problems quickly, allowing them to react accordingly. In addition, because parents/caregivers better understand the importance of early learning and development, they put more effort into educating their children at home. Better interactions between parents and their children at home is a foundation of a good home learning environment.

3.3 SCHOOL ENVIRONMENT AND MANAGEMENT

3.3.1 Preschool quality

This subsection addresses the following evaluation question: What is the impact of the intervention on classroom quality in the targeted preschools? Because the unit of analysis in this section is the preschool,

the sample is not big enough for DID using multiple regression. Therefore, we use t-tests to verify differences in classroom quality. The first difference is that between the baseline and endline surveys, and the second difference is that between control and intervention groups. Statistically significant DID may infer project causal impacts. The main domains of preschool quality are spaces and furnishing, language and reasoning, interactions, preschool curriculum structure, and teacher-parent conference. Please see detailed indicators of these domains in Annexe 2.

☒ Overall classroom quality

Figure 3-13 and Table A8-1 show the differences in overall classroom quality between the intervention and comparison groups in the baseline and the endline surveys.

- There is a significant difference between the comparison and intervention groups (DID = 0.9), which indicates that the project is likely to improve overall classroom quality by 0.9 points in addition to natural preschool improvement.
- The intervention group's overall score increased substantially from 1.4 in the baseline survey to 3.0 in the endline survey (difference = 1.7).
- There is a significant difference in overall scores between the comparison and intervention groups in the endline survey (difference = 0.5).
- In the baseline survey, there is a significant difference between the intervention and comparison groups' overall scores for classroom quality (difference = -0.4).
- In the endline survey, the comparison group's overall score for classroom quality is significantly different from that in the baseline survey, increasing from 1.8 to 2.5 (difference = 0.7).

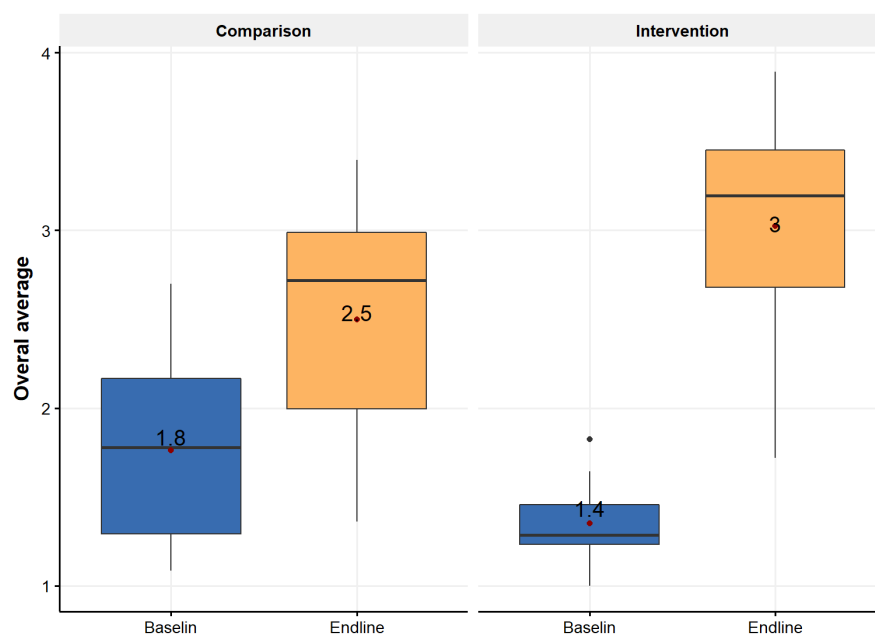


Figure 3-13. Differences in average total scores of classroom quality

☒ Spaces and furnishing

The indicators of spaces and furnishing are as follows: indoor space is sufficient for all children, has usable toilets, has tables and chairs suitable for preschool children, enough toys are available, there is a playground for gross motor play, there is access to drinking and usable water for children, and children bring drinking water from home.

Figure 3-14 and Table A8-2 show the differences in spaces and furnishing between the intervention and comparison groups and the baseline and endline surveys.

- a) There is a significant difference between the comparison and intervention groups (DID = 0.9), which indicates that the project is likely to improve spaces and furnishing by 0.9 points in addition to ordinary school improvements.
- b) The intervention group's score increased sharply from 1.8 in the baseline survey to 3 in the endline survey (difference = 1.2).
- c) There is a significant difference between the comparison and intervention groups' scores for spaces and furnishing in the endline survey (difference = 0.6).
- d) In the baseline survey, there was a significant difference between the intervention and comparison groups' average scores for spaces and furnishing (difference = -0.4).
- e) In the endline survey, the comparison group's average score was not significantly different from that in the baseline survey (difference = 0.3).

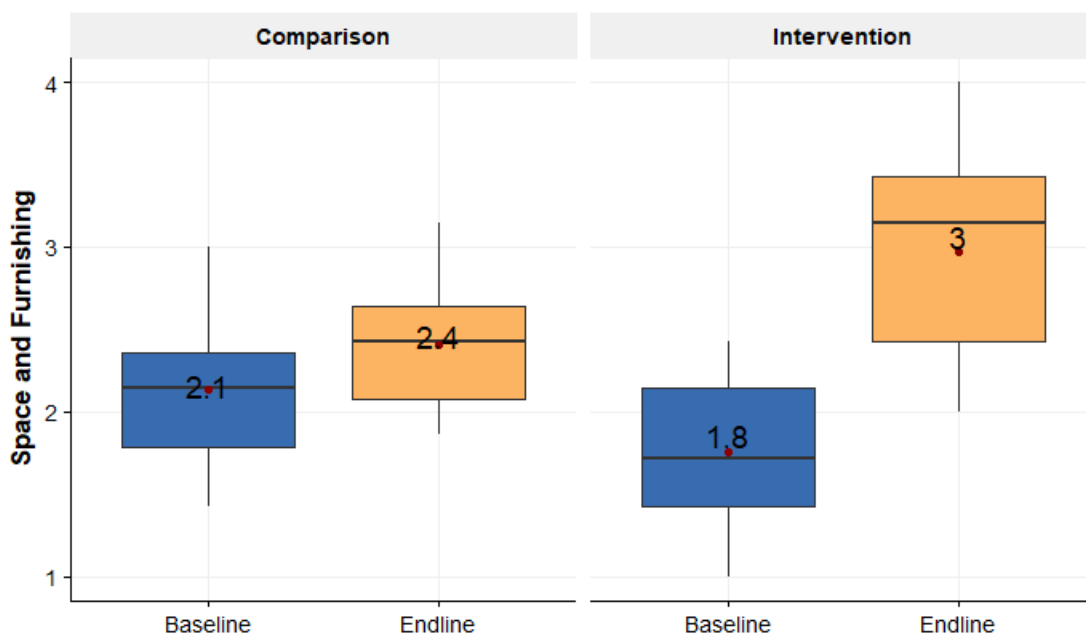


Figure 3-14. Differences in spaces and furnishing

The R.E. Learning project has brought specific changes to the schools that it supported, and those changes were noted by all teachers and school directors in the intervention group. The changes include improved school and classroom environments, school facilities, teaching and study materials, and other essential

materials required to operate a preschool. The project has provided the preschools with a wide range of teaching and study materials, including toys and reading materials. Furthermore, besides the cleanliness and tidiness of classrooms, teaching materials such as educational posters are placed in appropriate places for pedagogical purposes with creative flair to attract children's attention. One of the respondents made a similar point:

The classrooms are decorated attractively. There are more study materials and toys. The outdoor school environment is lovely, with a playground and things to play with. Teacher respondent ID 3



Figure 3-15. Activity 1.2.2: Distribution of teaching and learning materials to an intervention preschool

Photo taken by the project team on 11 November 2019



Figure 3-16. A classroom in an intervention preschool

Photo taken by the consultant on 6 February 2021

☒ Language and reasoning

The indicators of language and reasoning are age-appropriate books accessible for children, and teachers encourage children to speak during class.

Figure 3-17 and Table A8-3 show the differences in the language and reasoning between the intervention and comparison groups and the baseline and the endline surveys.

- a) There is a significant difference between the comparison and intervention groups ($DID = 1.7$), which indicates that the project is likely to improve children's language and reasoning by 1.7 points in addition to ordinary preschool improvement.
- b) The intervention group's average score increased sharply from 1.1 in the baseline survey to 3.2 in the endline survey (difference = 2.1).
- c) In the endline survey, there is a significant difference between the comparison and intervention groups' average scores for language and reasoning (difference = 0.9). Thus, although the comparison group's score has improved, the intervention group's improvement is more considerable.
- d) In the baseline survey, there was a difference in average scores for language and reasoning between the intervention and comparison groups (difference = -0.8).
- e) In the endline survey, the comparison group's average score for language and reasoning was not significantly different from that in the baseline survey (difference = 0.5).

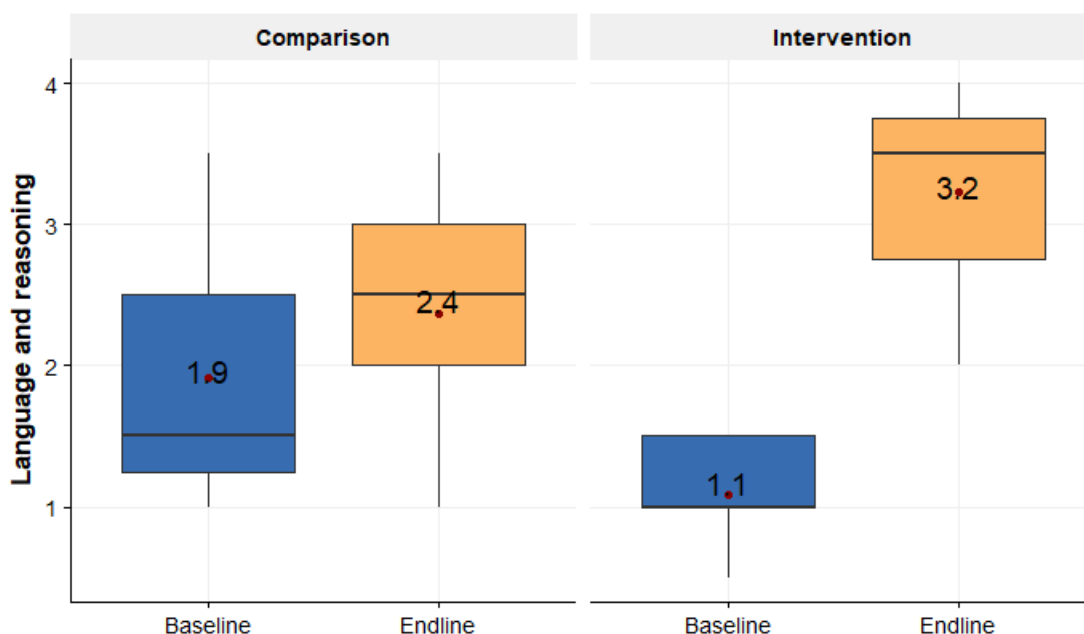


Figure 3-17. Differences in language and reasoning

Parents, teachers and other education staff agreed that the R.E. Learning project had provided a wide range of teaching and learning materials, including storybooks and textbooks for children, attracting children’s attention and improving their learning outcomes. Following are some statements from several respondents:

Before Save the Children, there were no study materials such as storybooks and pictures; chairs were few; classrooms were not clean, not good; there were no toys, toilets, storage, or handwashing tanks. Teacher respondent ID 7

Books with more pictures than letters help children read books ... they understand more books through pictures. Teacher respondent ID 3

Respondents also mentioned teachers’ strategies for encouraging children to speak during class. For example, one respondent noted that children typically tell her what they want or what their problems are. This suggests that children have the chance to talk and communicate with their teacher. A school director also observed that teachers encouraged children to speak in the class, building their confidence to speak up.

☒ Interactions

The indicators of interactions are as follows: teachers remind children about good habits and classroom behaviour/class rules every day, teachers notice a child’s feelings and react with sympathy and patience, teachers model good behaviour before encouraging children to try for themselves, teachers promote positive interactions between children, and teachers involve all children in the class.

Figure 3-18 and Table A8-4 show the differences in interactions between the intervention and comparison groups and the baseline and endline surveys.

- There is a significant difference between the comparison and intervention groups (DID = 0.9), which indicates that the project is likely to improve the interaction score by 0.9 points in addition to ordinary preschool improvement.
- The intervention group's average score increased sharply from 1.6 in the baseline survey to 3.4 in the endline survey (difference = 1.8).
- There is a significant difference in average scores between the comparison and intervention groups in the endline survey (difference = 0.5).
- In the baseline survey, there is no difference between the intervention and comparison groups' average scores for interactions (difference = -0.5).
- In the endline survey, the comparison group's average score is significantly different from that in the baseline survey, rising from 2.1 to 2.9 (difference = 0.9).

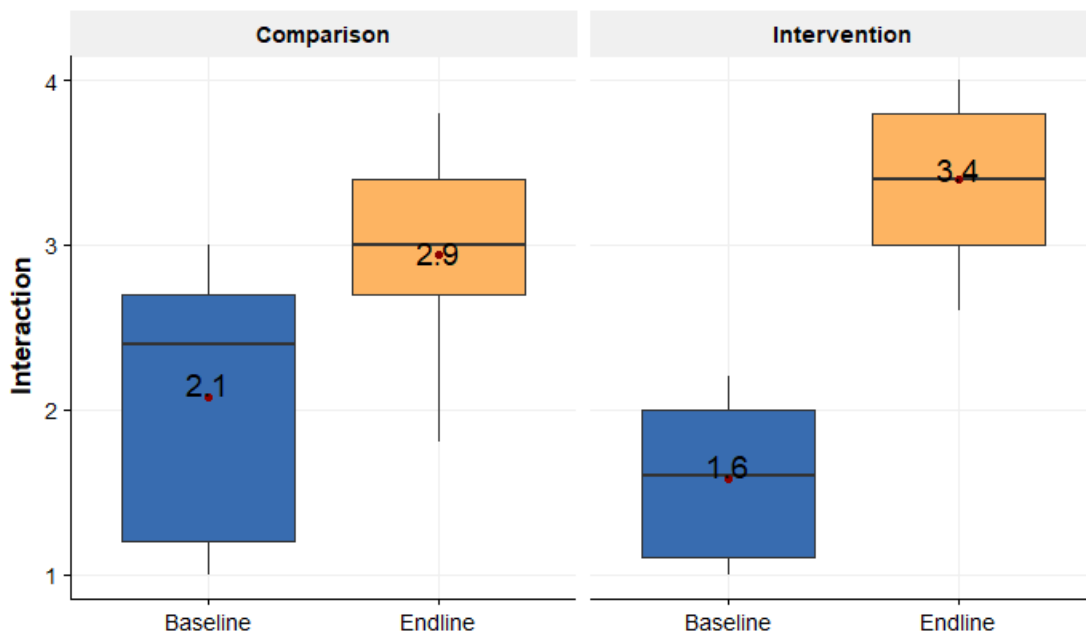


Figure 3-18. Differences in interactions

Some KII respondents in the intervention group observed that teachers improved their interactions with children following the R.E. Learning project implementation. For example, one parent said:

Teachers have become more competent in their interactions with children. They speak kind words and know how to comfort children. They also know how to talk to children and encourage them to follow the teacher's good habits. Parent respondent ID 6

Teachers themselves and DoE officers agreed that teachers had improved their teaching methods by increasing interactions with children in the classroom. For example, the following is an excerpt from a KII:

Since participating in the SCI training courses, I have improved my positivity towards management from around 50 percent to 60 percent. For example, I say sorry when I do something wrong so that children can apologise when they do something wrong. Moreover, I have improved my attitudes towards the children by being more friendly and patient. Since the improvement in teaching, I've

noticed that children comfort each other when anyone gets hurt in the playground. Teacher respondent ID 7

☒ **Preschool curriculum structure**

Preschool curriculum structure is measured using the following indicators: daily schedule is implemented as set out in the curriculum (state preschool has eight activities per day), children have time to play freely in class, at least half of activity time is organised in small groups (children interact with each other, not with a teacher).

Figure 3-19 and Table A8-5 show the differences in preschool curriculum structure between the intervention and comparison groups in the baseline and endline surveys.

- DID is not statistically significant (difference = 0.7), suggesting that the project is not likely to impact the preschool curriculum structure. Both the intervention and comparison groups showed similar improvements, but it is hard to conclude that the project affected this dimension.
- The intervention group's average score increased substantially from 1.2 in the baseline survey to 2.7 in the endline survey (difference = 1.5).
- There was no statistical difference in average scores between the comparison and intervention groups in the endline survey (difference = 0.4).
- In the baseline survey, there was no significant difference between the intervention and comparison groups (difference = -0.4).
- In the endline survey, the comparison group's average score was significantly different from that in the baseline survey (difference = 0.7).

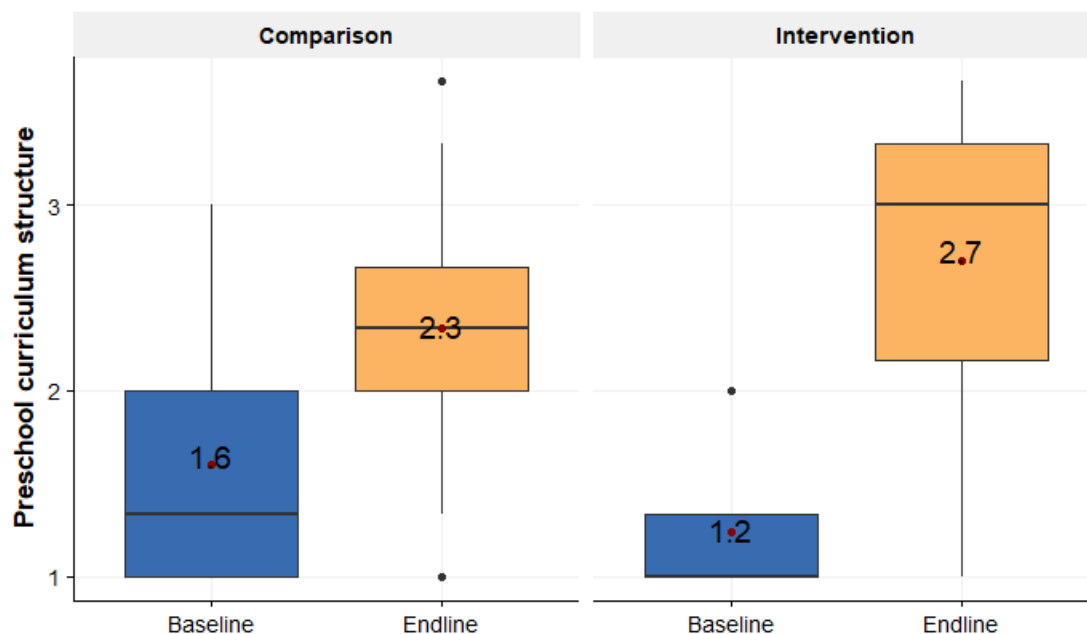


Figure 3-19. Differences in preschool curriculum structure

☒ Teacher-parent conference

The teacher-parent conference indicator is that teachers meet with all parents at least once a month. The differences in teacher-parent conference between the intervention and comparison groups and the baseline and endline surveys are shown in Figure 3-20 and Table A8-6.

- a) DID is not statistically significant (difference = 0.4), suggesting that the project did not affect parent-teacher relationships. Both the intervention and comparison groups showed similar improvements, but it is hard to conclude that the project affected this quality dimension.
- b) The average score of the intervention group increased substantially from 1.1 in the baseline survey to 2.8 in the endline survey (difference = 1.7).
- c) There is no significant difference in the average scores between the comparison and intervention groups in the endline survey (difference = 0.4).
- d) In the baseline survey, there was no significant difference between the intervention and comparison groups' average scores for the teacher-parent conference (difference= 0).
- e) In the endline survey, the comparison group's average score is significantly different from that in the baseline survey, increasing from 1.1 to 2.5 (difference = 1.4).

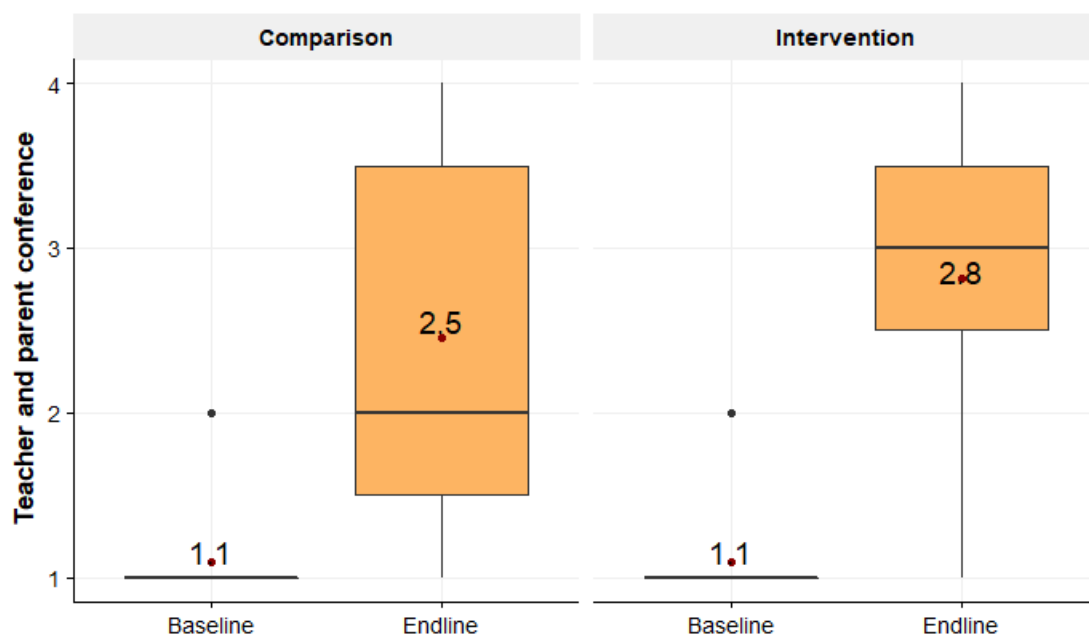


Figure 3-20. Differences in teacher-parent conference

The R.E. Learning project also encouraged teachers and parents/caregivers to establish positive relationships as it is believed that this will enable children to learn faster and positively affect their development outcomes as a whole. In addition, the project promoted consistent and complementary learning between home and school through school meetings and school activities, emergent literacy and maths at home, resource sharing, and so on. Doing so has encouraged parents/caregivers' greater involvement in their children's learning. Consequently, parents/caregivers know more about their

children's learning problems and can discuss them with teachers and directors. Besides, they can also learn how to teach their children at home.

Through meetings, participation, donations of some resources, These activities have contributed to the performance of teachers and the development of children, that is, more children attending school. Teacher respondent ID 11

Parents can know and understand a lot more about how to talk to and teach children at home when they have meetings with teachers. Parent ID 6

3.3.2 Supervision and monitoring and preschool quality

This subsection addresses the learning question: How can increased supervision and monitoring in remote areas be used to help improve teacher quality? The unit of analysis is the preschool; the number of observations is 44, with 22 preschools in the baseline survey and 22 in the endline survey.

We used three dimensions of preschool quality (interactions, language and consideration, and teacher-parent conference) as proxies for teacher quality. We used these proxy variables because we could not use the direct variables of teacher quality which is available in the endline survey but not in the baseline survey. We conducted Pearson's correlations to assess the relationships between each proxy of preschool quality and the variables of supervision and monitoring. The result of the correlations can infer the effect of supervision and monitoring on preschool quality.

The following are the variables of supervision and monitoring (for details, see Annexe 2):

- The number of times the director visited the preschool in the past year (Director_visits)
- The perception of the usefulness of the director's feedback (Director_feedback_useful)
- The number of times the DTMT person visited class in the past year (DTMT_visits)
- The perception of the usefulness of the DTMT person's feedback (DTMT_feedback_useful)
- The number of times the DoE visited the preschool in the past year (DoE_visits)
- The perception of the usefulness of the DoE's feedback (DoE_feedback_useful)
- The number of times the PoE visited the school in the past year (PoE_visits)
- The perception of the usefulness of the PoE's feedback (PoE_feedback_useful)
- The teacher's participation in the mentorship program either as a mentor or mentee (Mentorship).

We also used qualitative data collected from the KIIs to answer the question.

☒ Interactions

Table 3-1 shows Pearson's correlation between supervision and monitoring and interactions. Director_feedback_useful has a significant moderate³ positive relationship with interaction ($r = 0.5$, $p = 0.04$), indicating that the preschools with a high level of usefulness of director's feedback are more likely to have better interaction quality. PoE_feedback_useful also has a moderately positive association with interactions ($r = 0.46$, $p = 0.0987^*$). The results suggest that higher usefulness levels of the director's and

³ The correlation coefficients: < 0.2 is weak, between 0.2 and 0.5 is moderate and >0.5 is strong correlation (Acock 2008).

PoE's feedback are likely to improve interactions. Other variables of supervision and monitoring do not have significant associations with interaction.

Table 3-1. Pearson's correlation between supervision and monitoring, and interactions

Parameter 1	Parameter 2	R	T	p
Interactions	Director_visits	0.3759	2.5656	0.5520
Interactions	Director_feedback_useful	0.4988	3.6394	0.0472**
Interactions	DTMT_visits	0.2616	1.7142	1.0000
Interactions	DTMT_feedback_useful	0.2308	1.5003	1.0000
Interactions	DoE_visits	0.1844	1.1863	1.0000
Interactions	DoE_feedback_useful	0.2790	1.8372	1.0000
Interactions	PoE_visits	0.4665	3.3358	0.1016
Interactions	PoE_feedback_useful	0.4697	3.3646	0.0987*
Interactions	Mentorship	0.3464	2.3354	0.8127

N = 42, DF = 40, * p < 0.05, ** p < 0.01, *** p < 0.001

☒ Language and reasoning

Table 3-2 illustrates the results of Pearson's correlation between supervision and monitoring and language and reasoning. Again, only PoE_visits have a statistically significant moderately positive relationship with language and reasoning ($r = 0.58$, $p = 0.005$), suggesting that a higher frequency of PoE's visits is likely to lead to better quality language and reasoning. None of the other supervision and monitoring variables correlates with language and reasoning. The lack of significant correlations may be caused by the small sample size, which is only 42.

Table 3-2. Correlation between supervision and monitoring, and language and reasoning

Parameter 1	Parameter 2	r	t	p
Language_reasoning	Director_visits	0.3412	2.2959	0.8370
Language_reasoning	Director_feedback_useful	0.4667	3.3376	0.1016
Language_reasoning	DTMT_visits	0.3283	2.1980	0.9463
Language_reasoning	DTMT_feedback_useful	0.2941	1.9460	1.0000
Language_reasoning	DoE_visits	0.1989	1.2839	1.0000

Language_reasoning	DoE_feedback_useful	0.4015	2.7730	0.3442
Language_reasoning	PoE_visits	0.5767	4.4651	0.0045**
Language_reasoning	PoE_feedback_useful	0.4631	3.3044	0.1047
Language_reasoning	Mentorship	0.4179	2.9089	0.2594

N=42, DF=40, * p < 0.05, ** p < 0.01, *** p < 0.001

☒ Teacher-parent conference

Table 3-3 shows Pearson's correlation between supervision and monitoring and preschool quality (teacher-parent conference). Director_visit, Director_feedback_useful and PoE_visits have significant moderately positive relationships with preschool quality (healthy parent-teacher relationships) ($r=0.47$, $p=0.08$, $r=0.51$, $p=0.03$ and $r=0.57$, $p=0.005$, respectively). The results indicate that a high level of usefulness of directors' feedback and more frequent director and PoE visits are likely to lead to better quality parent-teacher relationships. None of the other supervision and monitoring variables correlate with the teacher-parent conference.

Table 3-3. Correlation between supervision and monitoring, and parent-teacher relationships

Parameter 1	Parameter 2	r	t	p
Parents_staff	Director_visits	0.4776	3.4376	0.0816*
Parents_staff	Director_feedback_useful	0.5108	3.7578	0.0339**
Parents_staff	DTMT_visits	0.3437	2.3145	0.8274
Parents_staff	DTMT_feedback_useful	0.2655	1.7415	1.0000
Parents_staff	DoE_visits	0.2219	1.4394	1.0000
Parents_staff	DoE_feedback_useful	0.3555	2.4053	0.7098
Parents_staff	PoE_visits	0.5751	4.4465	0.0047**
Parents_staff	PoE_feedback_useful	0.4664	3.3348	0.1016
Parents_staff	Mentorship	0.4526	3.2103	0.1308

N=42, DF=40, * p < 0.05, ** p < 0.01, *** p < 0.001

The supervising and monitoring activities of DoE and PoE officials are instrumental in ensuring that preschool teachers and directors are doing things right in their role. The supervision and monitoring could be done to spot how and what teachers are teaching students. Based on the interviews with teachers and directors, the supervision and monitoring by DoE and PoE officials improved teachers' teaching quality and capacity.

Frequent visits by DoE and PoE officials to remote preschools are practical and importantly follow up on whether or not teachers and directors are performing as expected. While observing and identifying weak points and finding ways to improve these, they could also come across good practices and share them with other preschool teachers and directors. With regular supervision and monitoring, weak points could be addressed and good points further enhanced. Meanwhile, good relationships and understanding with preschool teachers and directors could be built; then, communicating with teachers would be more direct and influential in keeping teachers motivated to work to the best of their ability.

The perspectives of preschool teachers and directors are similar to those of DoE and PoE officials. Those officials' primary duties and responsibilities are to ensure that teachers and directors follow MoEYS's educational policies, guidelines, procedures and action plans at the school and classroom level. Therefore, their supervision and monitoring are essential for better teaching and learning quality. In addition, as most DoE and PoE respondents mentioned in their interviews, their efforts help preschool teachers and school directors in management improvement, teaching capacity building, teaching material production, and teacher motivation.



Figure 3-21. Activity 2.2.2: Providing on-the-job coaching and mentoring to PoE and DoE staff on preschool monitoring and technical support

Photo taken by the project team on 20 June 2019

3.3.3 Teacher motivation

This subsection aims to address this question: “Does a small incentive scheme of preschool teacher motivation activities improve teacher performance and quality?” To that end, we identified the impacts of project implementation on teacher motivation because the project provided a small incentive package for well-performing teachers. Therefore, the project’s impact is equivalent to the effect of giving a small

incentive to a teacher. T-tests are used to identify the differences in teacher motivation between the intervention and comparison groups and between the baseline and endline surveys. The variables of teacher motivation include the following latent variables (please see Annexe 2):

- Teacher motivation regarding time spent on teaching activities (motive_time) is a latent factor of the following items: preparing lessons in advance, correcting students' work, providing free remedial help to students outside school hours, exchanging ideas or getting help from colleagues at school, and communicating with parents or caregivers
- Motivation regarding reasons to teach (motive_teach) including enjoying school and my teachers and wanting to be like them, loving working with children and helping them learn and grow, loving the subjects I teach, believing in the importance of education and wanting to help my community/country,
- Motivation regarding absence in teaching (motive_absence) includes the number of working days for which a teacher was absent except for sick leave and training.
- Motivation regarding teaching beliefs (motive_belief) includes satisfaction with the current teaching job, staying on to complete work after school hours rather than going home at the end of the preschool day, giving extra help to students after school and not expecting payment, sourcing and buying supplementary learning materials in their spare time using their own money, and pursuing further learning
- Overall motivation (total_motive) is overall teacher motivation derived from averaging the scores of all the main variables.

Overall motivation

Figure 3-22 and Table A9-1 present the t-test results of overall teacher's motivation. They show that:

- There was a significant difference between the comparison and intervention groups (DID = 15.5), indicating that the project is likely to increase overall teacher motivation by 15.5 percent.
- The intervention group's average score in the endline survey was significantly different from that in the baseline survey (difference = 14.3).
- There was a significant difference in average scores between the comparison and intervention groups in the endline survey (difference = 13.0).
- In the baseline survey, there was no significant difference in average scores for overall motivation between the intervention and comparison groups (difference = -2.5).
- In the endline survey, the comparison group's average score had no statistically significant difference from baseline (difference = -1.2).

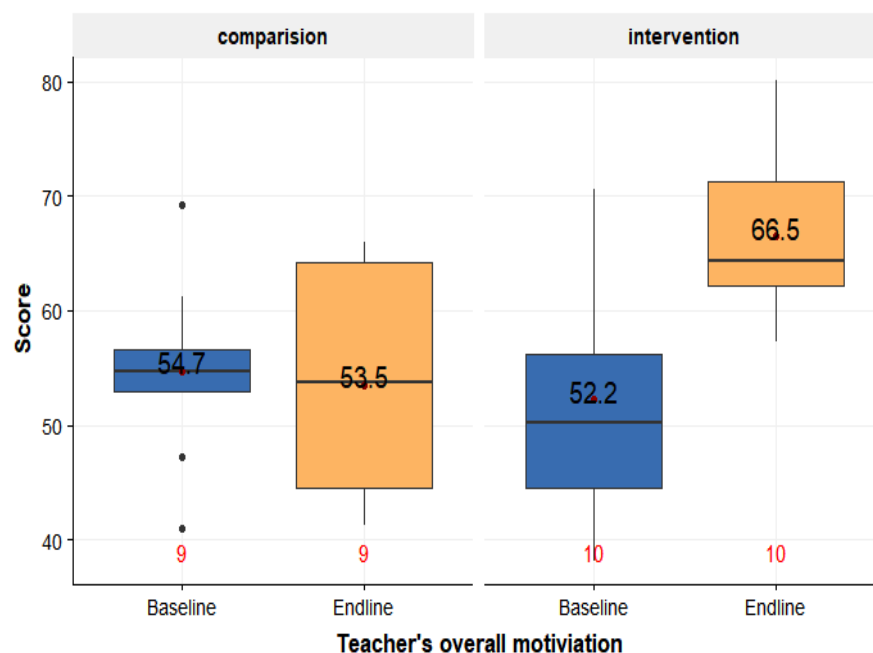


Figure 3-22. Differences in overall teacher motivation

☒ Motivation regarding time

Figure 3-24 and Table A9-2 present the t-test result of teacher motivation regarding time spent. They show that:

- There was a significant difference between the comparison and intervention groups (DID = 30.4), which indicates that the project is likely to improve teacher motivation regarding time spent by 30.4 percent.⁴
- There was no statistically significant difference between the intervention group's average score in the baseline survey and that in the endline survey (difference = 11.8).
- There was a significant difference in average scores between the comparison and intervention groups in the endline survey (difference = 26.9)
- In the baseline survey, there was no significant difference in average scores of motive_time between the intervention and comparison groups (difference = -3.5).
- In the endline survey, the average score of the comparison group was not statistically significantly different from that in the baseline survey (difference = -18.7).

⁴ It should be noted that there is a significant DID although neither the comparison nor the intervention group had any significant differences before and after the project, and there was no significant difference between the intervention and comparison groups before project implementation. The reason for this could be that the comparison group's mean difference is -18.7 and the intervention group's mean difference is 11.8. This is huge difference and why the DID is statistically significantly different.

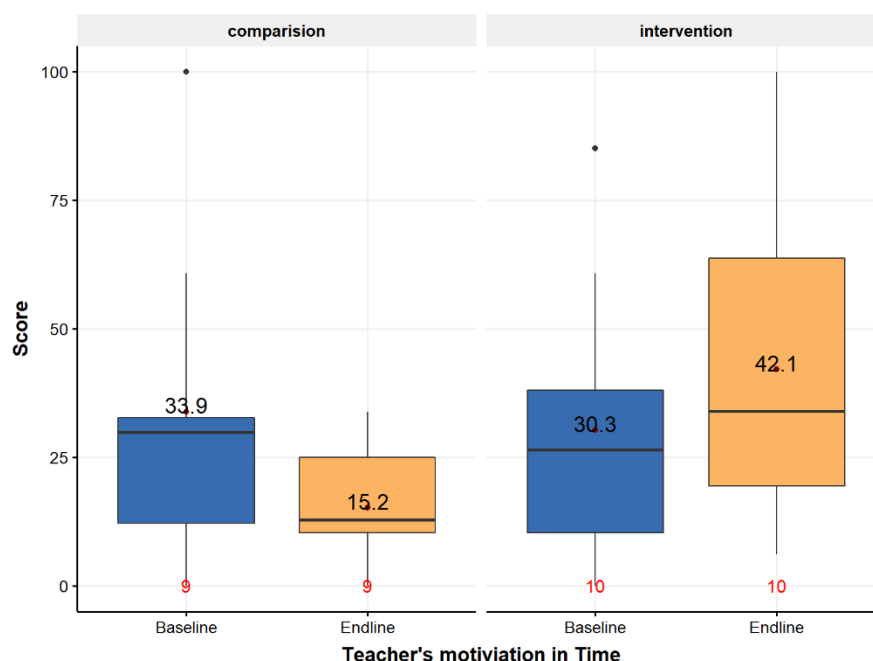


Figure 3-23. Differences in teacher motivation regarding time spent

☒ Motivation regarding reason to be a teacher

Figure 3-24 and Table A9-3 present the differences in teacher motivation regarding motivation to be teachers. They show that:

- In the endline survey, there was no significant difference in difference between the comparison and intervention groups (DID = 22.8), which indicates that the project is not likely to improve teacher motivation regarding reason to be a teacher.
- In the endline survey, the average score of the intervention group was significantly different from that in the baseline survey (difference = 45.0).
- There was no significant difference in average scores between the comparison and intervention groups in the endline survey (difference = 17.8).
- In the baseline survey, there was no significant difference between the intervention and comparison groups' average scores for motive_teach (difference = -5.0).
- In the endline survey, the average scores of the comparison group were significantly different from those in the baseline survey (difference = 22.2).

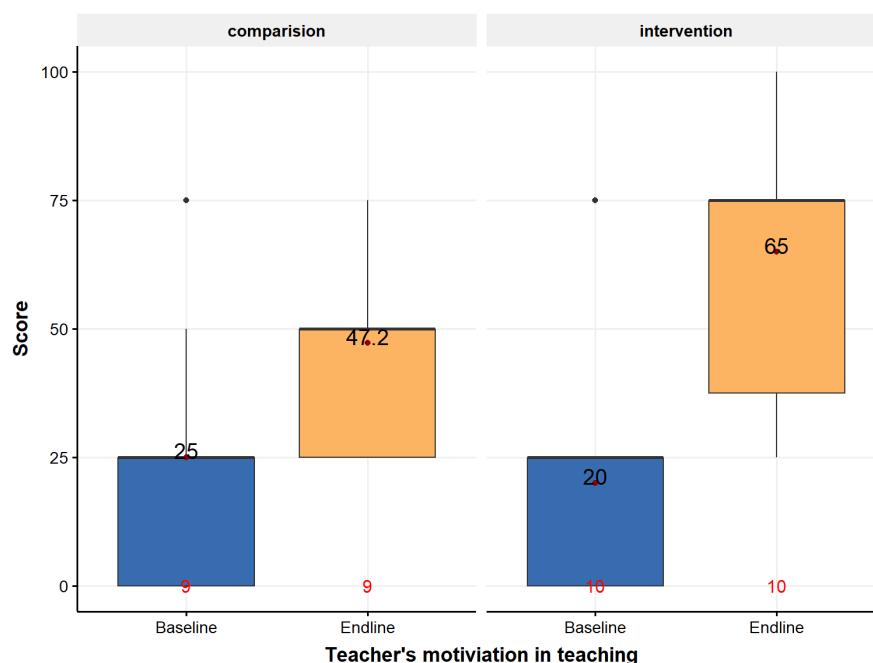


Figure 3-24. Differences in teacher motivation regarding reason to be a teacher

☒ Motivation regarding teacher beliefs

Figure 3-25 and Table A9-4 display the differences in teacher motivation regarding teacher beliefs. They show no significant difference between the comparison and intervention groups in the baseline and endline surveys, indicating that the project is not likely to improve teacher motivation regarding teacher beliefs.

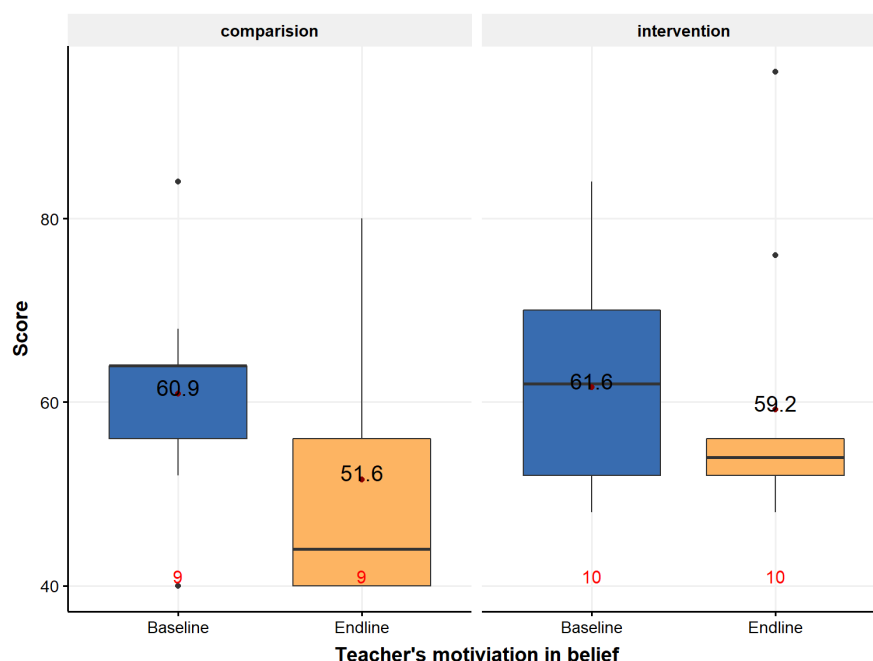


Figure 3-25. Differences in motivation regarding teacher beliefs

☒ Motivation regarding teacher absence

Figure 3-26 and Table A9-5 show the differences in teacher motivation regarding teacher's absence. There is no significant difference between the comparison and intervention groups in the baseline and endline surveys, which indicates that the project is not likely to improve teacher motivation regarding teacher absence. The reason for this could be that teachers in both groups had the highest scores in both the baseline and the endline surveys. This could also have been caused by the discrepancy in measuring teacher absence, measured by the number of working days that teachers were absent during the previous week. Therefore, there is a probability that a teacher was not absent during the reference period but had a high rate of absenteeism during the year.

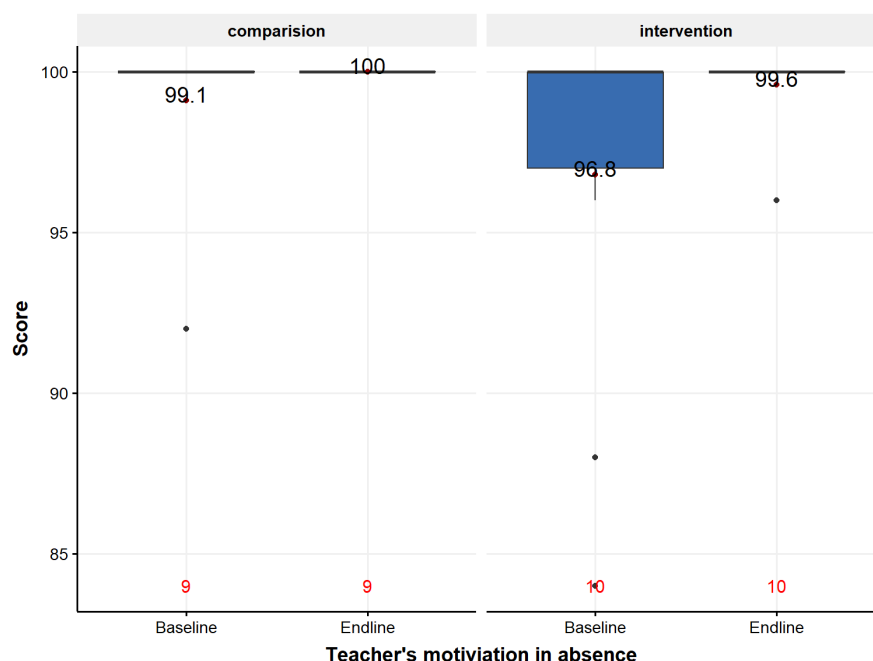


Figure 3-26. Differences in teacher motivation regarding absence from work

3.3.4 Caregiver participation

This subsection addresses the following question: How does caregiver participation in preschool activities correlate with teacher performance and children's development outcomes?

The variables used as the proxy for teacher performance are language and reasoning, teacher-parent conference, and interactions of the ECE/IDELA Preschool Environment observation tool.

We cannot use the variables for caregiver engagement collected from the parents/caregivers survey because the variables in the endline survey are different from those gathered in the baseline survey. So, we use the variables from the school director survey tool as the proxy for caregiver participation. Those variables include:

- Facilitators actively engage parents in ongoing communication and collaboration (Caregiver_engagement)
- Parents and community members are provided with training and capacity building (Caregiver_training)
- A group such as an ECCD Management Committee exists and includes representatives (ECCD_committee).

Pearson's correlations were conducted to assess the relationship between preschool quality (interactions, language and consideration, teacher-parent conference, and preschool curriculum structure) and the variables of caregiver engagement above. Table 3-4 shows the correlation between caregiver engagement and preschool quality. All the variables for caregiver participation have a statistically significant relationship with all variables for preschool quality.

Table 3-4. Correlation between caregiver engagement and preschool quality

Parameter 1	Parameter 2	R	t	p
Caregiver_engagement	Language_reasoning	0.4884	3.4951	0.0048
Caregiver_engagement	Parents_staff	0.6736	5.6922	0.0000
Caregiver_engagement	Interaction	0.4723	3.3459	0.0048
Caregiver_training	Language_reasoning	0.5855	4.5099	0.0005
Caregiver_training	Parents_staff	0.7390	6.8494	0.0000
Caregiver_training	Interaction	0.5676	4.3049	0.0008
ECCD_committee	Language_reasoning	0.6061	4.7583	0.0002
ECCD_committee	Parents_staff	0.5556	4.1727	0.0010
ECCD_committee	Interaction	0.5354	3.9591	0.0015

Based on correlation results, caregiver engagement strongly and positively correlates with preschool quality. KIIs with teachers and other education staff fully support these results. Following are the answers that we got from them.

Caregiver participation in preschool activities is of utmost importance in teacher performance and children's development outcomes. When parents/caregivers of children participate more often in preschool activities, they pay more attention to their children's learning and teaching. For instance, when parents present themselves at school or around school, their children would feel secure, while teachers would work best under the watchful eyes of parents.

[Parents] participate in school maintenance activities like helping look after outdoor playground facilities and cleaning those facilities. They helped clean the classrooms once at the weekend. [Parental participation] makes me enjoy teaching in preschool, making me do my best for my students. Teacher respondent ID 7

3.4 ACCESS AND QUALITY OF PRESCHOOLS

3.4.1 Specific challenges for access and quality in remote areas

Access to and the quality of preschools are the main challenges often found in remote areas. According to the parent respondents, family financial burden, school location, shortage of good teachers and school facilities, and inadequate study materials are the main factors that negatively affect children's educational access and quality of learning. In contrast, parents' lack of understanding about the importance of children's education is less reported.

There is a lack of teachers. For example, there are 50 students per class, but there are only three teachers. Parent respondent ID 5

Some parents expressed concern about their children's safety in travelling between home and preschool as the distance is too far for small children to travel alone. On the other hand, taking children to preschool takes parents away from their daily work, which is the primary source of family income. Therefore, it seems that most poor parents faced the dilemma of sending their children to preschool or losing some of their earnings, while they were not willing to risk their children's safety by letting them walk to school on their

own. Therefore, the opportunity cost of preschooling is that parents in remote areas either decide to take their children to school and look after them during schooltime or keep their children at home all day or with them while they work.

For specific challenges, there is a concern for children's safety, the long walk to and from school, and the risk of them getting out of school. Parent respondent ID 23

Similarly to parents, school directors, teachers, DoE and PoE officials raised the challenges of preschool access and learning quality in remote areas. The top challenges are lack of qualified preschool teachers, buildings, classrooms, study materials and other facilities for learning and teaching; family financial burden; parents' insufficient knowledge and understanding about the importance of early years education; and safety concerns about children commuting to school. Other challenges include health problems, lack of encouragement and motivation from parents and teachers, and heavy seasonal rains.

Some parents do not understand and do not send their children to school. There is a lack of materials, and schools are not attractive to children. Preschools borrow primary school teachers to teach preschool students, but they use the wrong techniques. DoE respondent ID 9

School-related factors such as the lack of good teachers, classrooms, study materials and other facilities are usually the responsibility of MoEYS departments. In contrast, financial problems, lack of parental encouragement, insufficient knowledge, transport and travel safety, and other similar factors concern the parents/caregivers responsible for children's education and development. Thus, children from low-income families in remote areas are likely to face more problems accessing quality preschool education since they lack transport, healthy food, and money for daily schooling.

Moreover, if no appropriate measures are put in place to resolve remote preschools' challenges, children will miss early childhood learning. As a result, their future learning and development outcomes will be lower than those of the children elsewhere who attend preschool.

The challenge is that people's homes are far away from schools, and they have difficulty getting their children to school. Another is the weather, with occasional heavy rains making it impossible for parents to send their children to school. PoE respondent ID 10

3.4.2 How to improve access and quality of preschools in remote areas

As reported above, there are many challenges facing preschools' access to and quality in remote areas. However, there are also possible solutions that parents, teachers, school directors, and DoE and PoE officials suggested might help overcome these issues. Those solutions are primarily based on their practical experience or perspective of the challenges they have faced in their communities. They believe that these solutions could help improve preschool access and quality problems in their areas.

Parents tend to focus more on requesting SCI or other organisations to continue their support for their children's school and other preschools across the country. Primarily, SCI should help better equip schools with study materials and facilities such as a playground full of toys and play equipment that attract children to come to school and enjoy learning. Most parents in both the treatment and comparison groups requested that preschools be well equipped with proper facilities and equipment suitable for young children to play, develop and learn better, as a good school and classroom environments contribute to children's learning outcomes and development. Moreover, more support could be elicited from teachers, parents, local authorities, and other stakeholders in child learning through, for example, distributing clear information, organising open meetings with stakeholders to discuss children's learning and problems, and encouraging parents to devote more time and resources to their children's learning and development.

The organisation should sponsor more study materials and often come to meet parents. Parent respondent ID 5

Improve the quality of preschools in remote areas through more training, study activities, playground and fun places. Parent respondent ID 17

Moreover, some parents also insisted on having more preschool teachers with suitable teaching methods and techniques, allowing children to learn better in class. They also stressed that teachers should pay more attention to children, whether in or out of school. For better preschool quality, other parents felt that more teacher training programs or courses should be provided to enhance teacher capacity and knowledge, which in turn would help them find new ideas or ways of teaching and class activities that are beneficial and suitable for children of different levels.

The quality of preschools in remote areas should be improved by continually strengthening teacher capacity. Parent respondent ID 2

As implementers at the school level, teachers emphasised the importance of the participation and involvement of parents and the community in ensuring children's learning outcomes as well as preschool quality. Collaboration between teachers, parents and the community is needed to improve the quality of remote preschools. Some teachers similarly demanded more resources, study materials, facilities and other teaching aids to help improve their teaching and children's learning success. Furthermore, more teachers appreciated the importance of SCI's and other organisations' support such as funding, study materials, equipment and technical assistance, among others. So, they would like SCI and other organisations to continue their support for the development of preschools in remote areas.

The involvement and participation from the community, parents, students, teachers and stakeholders in the overall development of the school. Teacher respondent ID 7

More involvement from parents and more support from SC. Teacher respondent ID 3

As leaders, school directors made similar suggestions to improve preschool quality and development. They believed that teacher capacity, knowledge and ethics are essential elements that should be strengthened and enhanced through training programs on teaching methods and techniques, classroom management, teacher clubs to exchange ideas, and other vital teaching-related areas. More importantly, motivation and encouragement are essential to keep teachers working hard to educate children.

In my opinion, to improve the quality of preschools in remote areas, we should enhance teacher's performance, provide sufficient techniques, and build teaching quality through training or workshops. Director respondent ID 22

As supervising and monitoring agents ensuring the quality of education, PoE and DoE officials propose more suggestions for improving preschool quality and development in remote areas. However, their proposed solutions are not much different from those of teachers, school directors and parents as they have faced similar problems in their locations. For instance, the officials pointed out that teacher capacity and teaching techniques, school buildings, study materials, teaching facilities, and parental and community involvement should be improved. They also state a campaign or program that intends to inform parents and the community and send children to school.

The solutions should be to request the ministry for enough teachers, contact the partner organisation to request preschool buildings. Deputy Director of DoE respondent ID 1

Particularly, preschools need more funding sources besides a limited budget from MoEYS, meaning that SCI or other relevant stakeholders should mobilise funding and resources in supporting preschool quality and development. Some officials suggested building more state and community preschools closer to

children's homes in remote areas. At the same time, there should be enough preschool teachers for the number of children in those residential areas, and extra financial support should be given to children from low-income families.

Some programs should be implemented to improve the preschools in remote areas. They are training on teaching techniques, providing study materials, encouraging relevant authorities to monitor the teaching and learning process, giving support to parents to send children to school, and encouraging community preschool teachers. Early childhood officer respondent ID 20

4 CONCLUSION AND RECOMMENDATIONS

4.1 CONCLUSIONS

Based on the results of the quantitative and qualitative analyses, we can confirm that the R.E. Learning project has significant positive impacts on early childhood learning and development outcomes of children aged 3-6. Following is a summary of the results from this report.

☒ Child learning and development

The R.E. Learning project has a significant positive impact on early childhood learning and development outcomes. The children who attended the preschools under the R.E. Learning project are likely to increase their total IDELA score by 26.5 percent. In addition, the project is expected to raise the IDELA scores of children in the intervention preschools in all domains, including motor development, emergent literacy, emergent numeracy, and socio-emotional development. The project's positive impacts on these three domains are possibly due to professional development and support networks. The project was established by providing training and mentoring/coaching, emergent literacy and maths skills and play-based learning, and encouragement for family and community engagement.

The five most influential factors affecting children's learning and development are quality of teaching, preschool curriculum, type of preschool teacher as state teacher, caregiver's engagement with child's learning at home, duration in preschool. Other determining factors are as follows. At the child's characteristics level, child's age and child's attendance at school are the crucial determining factors of child's learning and development. At the home learning environment level, another major determining factor is reading materials at home. Finally, in the school environment, another determinant is teachers' absenteeism.

☒ Home learning environment

The project significantly improved home learning environments across all dimensions, namely reading materials at home, learning toys at homes, caregiver's engagement with children's learning at home, and overall home learning environment. The finding implies that the families involved in the project improved their overall home learning environment by 15.5 percent more than those not involved in the project. This finding is supported by the KII findings that children's home learning environments improved once parents started to understand the importance of their children's early education and provide their children with essential learning supports.

☒ Classroom quality and school management

The findings pointed out that the project is likely to improve overall classroom quality. In the endline survey, the intervention preschools increased their average quality score from 1 (inadequate) to 3 (good), while those in the comparison group also improved their quality score from 1 to 2.5. These results indicate that the project is likely to improve overall classroom quality by 0.9 points with a 4-point scale (22.5 percent) in addition to natural preschool improvements during the project period. The findings also highlight that the project is likely to positively influence three dimensions of preschool quality: interaction, language and reasoning, and space and furnishing. It is not likely to considerably affect the dimensions of teacher-parent conferences and preschool curriculum structure. Both the intervention and comparison groups had similar improvements regarding these aspects, which provide little evidence to conclude that the project affected these quality dimensions.

☒ Supervision and monitoring and preschool quality

The results suggest that higher usefulness levels of director and PoE feedback are likely to improve quality interactions. They also point out that a higher frequency of PoE visits is expected to lead to better language and reasoning for teachers. In addition, the results indicate that a higher level of usefulness of directors' feedback and more frequent director and PoE visits are likely to lead to a better teacher-parent conference. Other variables of supervision and monitoring were not associated with the quality of teachers.

☒ Teacher motivation

A small incentive scheme is more likely to improve teacher motivation regarding time spent, such as preparing lessons in advance, correcting students' work, providing free remedial help to students outside school hours, exchanging ideas or getting help from colleagues at school, and communicating with parents or caregivers. However, it is not likely to improve teachers' motivation regarding other aspects such as their reasons to be teachers, beliefs and absenteeism.

☒ Caregiver engagement

Based on correlation results, caregiver engagement strongly and positively correlates with preschool quality. KIIs with teachers and other education staff fully support these results. Caregiver participation in preschool activities is of utmost importance in teacher performance and children's development outcomes. When parents or caregivers of children participate more often in preschool activities, they pay more attention to their children's learning and teaching. For instance, when parents present themselves at school or around school, their children would feel secure, while teachers would work best under the watchful eyes of parents.

☒ Access and quality of preschools in remote areas

Various preschool access and quality challenges in remote areas were raised by parents/caregivers, teachers, and other education staff. All stated that the top reasons that negatively affect children's educational access and quality are household financial burden, school distance from home and children's safety when commuting, the limited number of qualified teachers and school facilities, poor quality buildings and classrooms, inadequate study materials, lack of qualified teachers, caregivers' insufficient education and low understanding of educational importance, lack of encouragement and motivation from parents and teachers, health problems, and bad weather such as heavy rain.

4.2 RECOMMENDATIONS

The SCI project has made significant contributions to the targeted preschools. Still, there are remaining points to be considered for improving the current and future implementation of the project to provide beneficiaries with even more fruitful outcomes and complete the project activities with even more success. Therefore, the following suggestions are put forward for consideration, based on both quantitative and qualitative analyses.

The project has significant positive effects on overall child learning and development, home learning environment, preschool quality, and teacher motivation. Nonetheless, the project is not likely to improve certain areas, such as parent-teacher conference, preschool curriculum structure, and teachers' intrinsic

motivation. Therefore, more attention should be paid to the project components that can help enhance these areas.

☒ Child development outcomes

Future intervention should invest more or reinforce the top five determining factors of child learning and development, including interaction, preschool curriculum, capacity building for community preschool, caregiver's engagement with child learning at home, and child duration in preschool at least for one year. If these factors are enhanced, children's learning and development will significantly improve by around 5 percent to 12 percent. Other areas of focus should be children's attendance at school, reading materials at home, and the teacher's regular presence at work.

☒ Supervision and monitoring

The monitoring and review activities are of the utmost importance in ensuring the proper development and implementation of the project. The informed decisions of the project should be made based on reviewing activities and evidence of the project while listening to suggestions and ideas of relevant stakeholders. The results suggest that only director and PoE visits, and their helpful feedback, are likely to be associated with better preschool quality. However, the DTMT person and DoE's visit and feedback and mentorship program are not associated with preschool quality. Thus, the supervision and monitoring activities of the DTMT and DoE official and mentorship program should be improved to contribute to preschool quality.

☒ Teacher motivation and capacity building

Preschool teachers confront and deal with children's problems at school, so teachers should be given non-monetary and monetary incentives based on their work performance. Such motivation given to teachers would offer a fresh impetus towards better teaching and learning quality. The results imply that a small incentive scheme may stimulate overall teacher motivation, mainly helping teachers work harder to chase the scheme. Nonetheless, it did not improve intrinsic motivation, such as reason to be a teacher and positive teacher beliefs. A small incentive scheme can only stimulate teacher motivation in the short term, as when the incentive scheme ends, the associated motivation may also stop. Therefore, the long-term solution to teacher motivation is to boost internal encouragement by providing coaching, mentoring, capacity building, and long-term career advancement. Another solution is to recruit the right people with exemplary dedication as a person lacking such skill and compassion may well not develop these aspects quickly.

There should be more teacher training programs or courses to enhance teacher capacity and knowledge regarding teaching and learning quality, training programs on teaching methods and techniques, classroom management, and the creation of teacher clubs to exchange ideas and other teaching-related primary areas. Doing so could help teachers design class activities that are more suitable for children of different levels. In addition, there should be more preschool teachers trained in appropriate teaching methods and techniques.

☒ Community engagement

More support from parents, caregivers, teachers, local authorities and other stakeholders in promoting children's learning and development at school and home is needed. This support should be expanded through information dissemination, open meetings to discuss the challenges of children's learning, and encouragement for parents or caregivers to dedicate time and resources to their children's learning and

development at home. Therefore, any forms of involvement and collaboration in preschool quality improvement are desirable.

Outreach support to households

Children from low-income families and those who live far away from preschool need financial and transport support that helps ensure children can attend preschool at young ages. The KIs indicate that financial burden and children's travelling to preschools are critical obstacles for children accessing preschool in remote areas. As some children live far from their preschools, support in transporting children from home to school and vice versa would help solve the problems of preschool access. Furthermore, necessary study materials and textbooks should also be given to these households.

REFERENCES

Acock, Alan C. 2008. *A Gentle Introduction to Stata, Second Edition*. Stata Press.

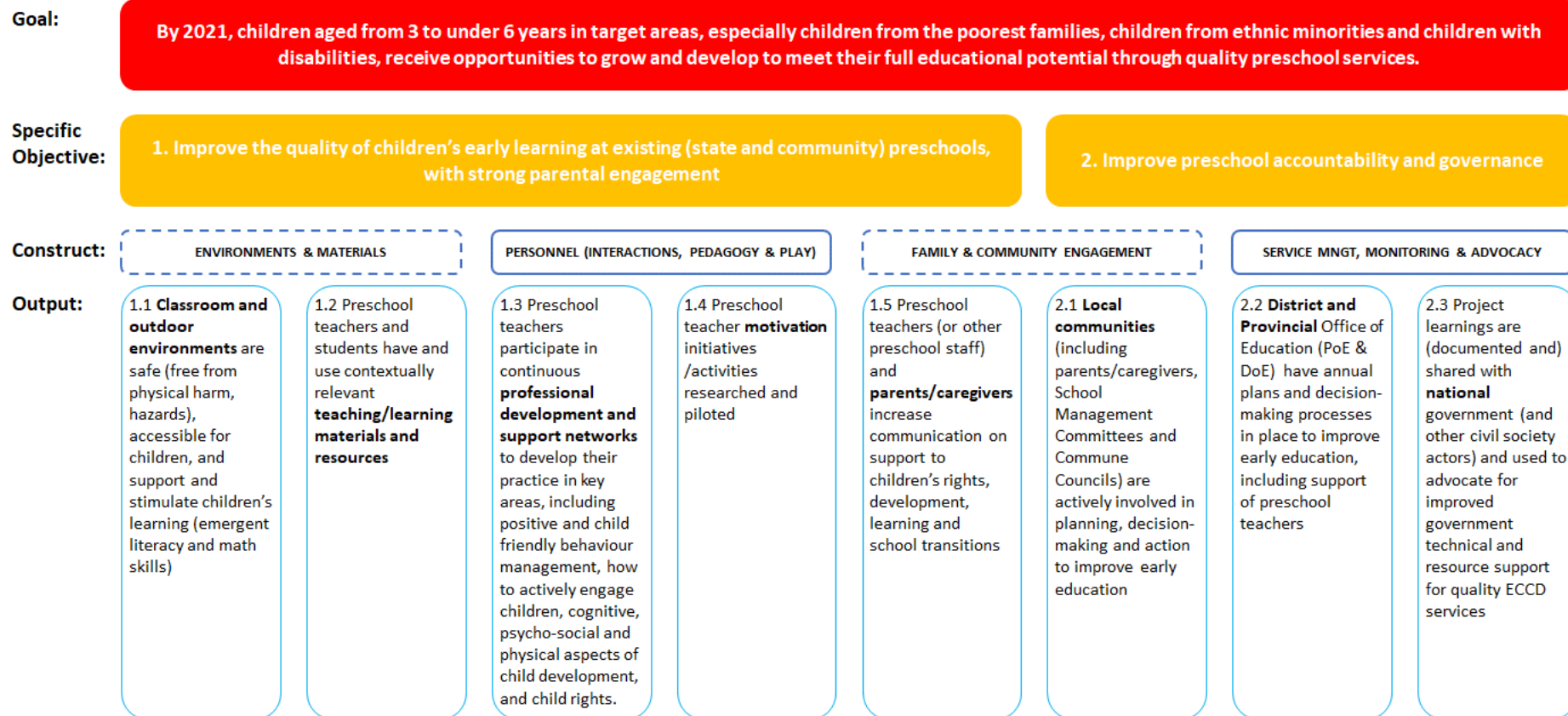
Eriksson, Mårten, Peter Marschik, Tiia Tulviste, Margareta Almgren, Miguel Pérez-Pereira, Sonja Wehberg, Ljubica Umek, Frederique Gayraud, Melita Kovačević, and Carlos Gallego. 2012. "Differences between Girls and Boys in Emerging Language Skills: Evidence from 10 Language Communities." *The British Journal of Developmental Psychology* 30 (June): 326–43. <https://doi.org/10.1111/j.2044-835X.2011.02042.x>.

Guajardo, Jarret, Kun Heng, Bounkheang Kou, and Jonathan Seiden. 2018. "Remote Early Learning Project." Baseline Report. Phnom Penh, Cambodia: Save the Children.

Save the Children. 2021. "About IDELA." IDELA. 2021. <https://idela-network.org/about/>.

Save the Children. n.d. "IDELA & LA: Baseline-Endline Assessment Report." Vietnam: Save the Children.

ANNEXE 1: R.E. LEARNING PROJECT LOGICAL FRAMEWORK SUMMARY



ANNEXE 2: LIST OF VARIABLES

Variable Name	Description/ questions in the survey tools	Survey tool	Variable measurement	Model1: Impact on children learning and development	Model 2: Determinants of Children Learning and Development	Model: Impact on home learning environment
ECCD committee at school	4.3 A group such as an ECCD Management Committee exists and includes representatives and a cross-section of the community (e.g. by age, employment, gender, disability). (Note: requires access to and review of attendance records to assess the committee's composition).	Director questionnaire	Recode to binary variable, 0=not functioning (code 1-2) 1=functioning (code 3-4)	Not included	Independent variable	Not included
Emergent numeracy	Composite score of Number sense; Shapes; Sorting; Problem-solving; Comparison; Simple operations	IDELA	Composite score: percentage of correction answers	Dependent variable	Not included	Not included
Child's age	Child's age in year	IDELA	Year	Independent variable	Independent variable	Independent variable
Child's sex	Child's sex as female	IDELA	Dummy (1 = Girl, 0 = Boy)	Independent variable	Independent variable	Independent variable
Emergent language and literacy	Composite score of Print awareness; Expressive vocabulary; Letter; Phonological awareness; Listening comprehension	IDELA	Composite score: percentage of correction answers	Dependent variable	Not included	Not included
Motor development	Composite score of Fine and gross motor skills: Hopping,	IDELA	Composite score: percentage of correction answers	Dependent variable	Not included	Not included

	Copying shape, Folding paper, Drawing					
Overall IDELA score	Composite score of all IDELA domains	IDELA	Composite score: percentage of correction answers	Dependent variable	Not included	Not included
Social-emotional development	Composite score of Empathy; Emotional awareness; Self-awareness; Solving conflict; Peer relationships	IDELA	Composite score: percentage of correction answers	Dependent variable	Not included	Not included
Caregiver attitude	The composite score of the following items in (PART 6: Parent Attitudes (Optional)): <ul style="list-style-type: none"> a. Parents play an essential role in a child's learning and development? b. Understanding how to read and write is vital for a child for their future growth c. Parents can help train / educate children while at home. d. Children can learn many skills by playing various games. e. It is possible for parents to talk to their children or encourage them to play games while doing their daily chores. f. Praise the child when he does something new that is important 	IDELA-HE	Factory score which is classified as a categorical score: 1=Low, 2=Medium, 3=High	Not included	Independent variable	Not included

Caregiver's engagement with child's learning at home (Rescale to 0-100)	<p>Percentage of Home learning activities:</p> <p>3. In the past week, did you or any other family member older than 15 years engage in these activities with <<insert child's name>>? (PART 3)</p> <p>a. Read books or look at picture books with a child?</p> <p>b. Tell stories to the child?</p> <p>c. Sing songs to or with the child, including lullabies?</p> <p>d. Take the child outside the home? For example, to the market, visit relatives.</p> <p>e. Play with the child any simple games?</p> <p>f. Name objects or draws things to or with the child?</p> <p>g. Show or teach your child something new, like teach a new word or teach how to do something?</p> <p>h. Teach the alphabet or encourage to learn letters to the child?</p> <p>i. Play a counting game or teach numbers to the child?</p> <p>j. Hug or show affection to your child?</p>	IDELA-HE	Recode these individual items to be binary variable (1=Yes, 0=No), then run PCA, and rescaled to 0-100	Not included	Not included	Dependent variable
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Caregiver's engagement with child's learning at home (Category)	<p>Percentage of Home learning activities:</p> <p>3. In the past week, did you or any other family member older than 15 years engage in these activities with <<insert child's name>>? (PART 3)</p> <p>a. Read books or look at picture books with a child?</p> <p>b. Tell stories to the child?</p> <p>c. Sing songs to or with the child, including lullabies?</p> <p>d. Take the child outside the home? For example, to the market, visit relatives.</p> <p>e. Play with the child any simple games?</p> <p>f. Name objects or draws things to or with the child?</p> <p>g. Show or teach your child something new, like teach a new word or teach how to do something?</p> <p>h. Teach the alphabet or encourage to learn letters to the child?</p> <p>i. Play a counting game or teach numbers to the child?</p> <p>j. Hug or show affection to your child?</p>	IDELA-HE	Factory score which is classified as a categorical score: 1=Low, 2=Medium, 3=High	Not included	Independent variable	Not included
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Children with disability (CWD)	Part 5: Disability: 1. Do you suspect or know that the child has any disabilities?	IDELA-HE	1 = disable, 0 = not disable	Independent variable	Independent variable	Independent variable
Household socio-economic status (SES)	Percentage of caregiver's assets: 3. Does your home have (PART 4): a. electricity? b. radio c. television? d. mobile telephone? e. phone f. refrigerator? g. wardrobe h. sewing machine or loom i. CD/DVD player? j. generator/battery/solar panel? k. bicycle l. motorcycle? m. car n. Koyon o. tractor p. land for crops? q. livestock (buffalo, cow, horse, chicken, duck, goose...) (only use the items that were used in the baseline)	IDELA-HE	Factory score which is classified as a categorical score: 1=Low SES, 2=Medium SES, 3=High SES	Not included	Independent variable	Independent variable

Learning toys at home (Category)	<p>Percentage of home toys:</p> <p>2. I am interested in learning about the things that your child plays with when s/he is at home. Does s/he play with:</p> <p>a. Homemade toys, such as stuffed dolls, cars, or other toys made at home?</p> <p>b. Toys from a shop or manufactured toys?</p> <p>c. Household objects, such as bowls, cups or pots?</p> <p>d. Objects found outside, such as sticks, stones or leaves?</p> <p>e. Does your child have any drawing or writing materials?</p> <p>f. Does a child have any puzzles (even a two-piece puzzle counts)?</p> <p>g. Does your child have any two or three-piece toys that require hand-eye coordination?</p> <p>h. Does a child have toys that teach about colours, sizes or shapes?</p> <p>i. Does a child have toys or games that help teach about numbers/counting?</p>	IDELA-HE	Factory score which is classified as a categorical score: 1=Low, 2=Medium, 3=High	Not included	Independent variable	Not included
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Learning toys at home (Rescaled o 0-100)	<p>Percentage of home toys:</p> <p>2. I am interested in learning about the things that your child plays with when s/he is at home. Does s/he play with:</p> <p>a. Homemade toys, such as stuffed dolls, cars, or other toys made at home?</p> <p>b. Toys from a shop or manufactured toys?</p> <p>c. Household objects, such as bowls, cups or pots?</p> <p>d. Objects found outside, such as sticks, stones or leaves?</p> <p>e. Does your child have any drawing or writing materials?</p> <p>f. Does a child have any puzzles (even a two-piece puzzle counts)?</p> <p>g. Does your child have any two- or three-piece toys that require hand-eye coordination?</p> <p>h. Does a child have toys that teach about colours, sizes or shapes?</p> <p>i. Does a child have toys or games that help teach about numbers/counting?</p>	IDELA-HE	Factory score, which is classified as a categorical score: rescale to 0-100	Not included	Not included	Dependent variable
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Negative discipline on children	Caregiver negative discipline practice: 3. In the past week, did you or any other family member older than 15 years engage in these activities with <<insert child's name>>? (PART 3) k. Spank your child for misbehaving? m. Criticise or yell at your child?	IDELA-HE	Factory score which is classified as a categorical score: 1=Low, 2=Medium, 3=High	Not included	Independent variable	Not included
Number of children in the family	16. How many children are in the family?	IDELA-HE	Integer	Independent variable	Independent variable	Independent variable
Reading materials at home (Category)	Percentage of home reading materials: 1. Do you have any of the following types of other reading materials at home? (PART 3) a. Storybooks/picture books for young children? b. Textbooks? c. Magazines? d. Newspapers? e. Religious books? f. Coloring books? g. Comics books? h. Novels or fact books i. Fabric book for young children age 0.2	IDELA-HE	Factory score which is classified as a categorical score: 1=Low, 2=Medium, 3=High	Not included	Independent variable	Not included

Reading materials at home (rescale to 0-100)	Percentage of home reading materials: 1. Do you have any of the following types of other reading materials at home? (PART 3) a. Storybooks/picture books for young children? b. Textbooks? c. Magazines? d. Newspapers? e. Religious books? f. Coloring books? g. Comics books? h. Novels or fact books i. Fabric book for young children age 0.2	IDELA-HE	Factory score, which is classified as a categorical score: rescale to 0-100	Not included	Not included	Dependent variable
School attendance - child	6. How regularly does he/she attend the pre-school/ early learning program? (Part 2)	IDELA-HE	1= Regular (this for daily, code 5); 0=Not regular (this for not daily, group code 4-1=0)	Independent variable	Independent variable	Independent variable
The duration that a child has been in this preschool	4. How long has your child been in this preschool/program? (Part 2)	IDELA-HE	0= Less than a year; 1= One year and above	Independent variable	Independent variable	Independent variable
Type of caregivers	11. Who is the primary caregiver of the child?	IDELA-HE	0 = mother or father, 1 = grandparents, 2 =Others	Independent variable	Independent variable	Independent variable

Quality of teaching	Composite score of the following items: 9. Teachers inform children about good habits and classroom behaviours/class rules every day 10. Teachers notice a child's feeling and react with sympathy and patience. 11. Teacher model's behaviour before assisting children in trying themselves. 12. Teacher promotes positive interactions between children 13. Teacher involves all children in the class	Preschool environment	Recode (1 = Good quality, 0 = Low)	Not included	Independent variable	Not included
Teacher and parent conference	17. Teachers meet with all parents at least once a month	Preschool environment	Recode (1 = Good quality, 0 = Minimal quality)	Not included	Independent variable	Independent variable
Language - Reasoning	Composite score of the following items: 7. Age-appropriate books are accessible for children. 8. Teacher encourages children to speak during class hour.	Preschool environment	Recode (1 = Good quality, 0 = Minimal quality)	Not included	Independent variable	Not included
Preschool curriculum structure	Composite score of the following items: 14. Daily schedule is implemented as set out in the curriculum (state preschool has eight activities per day). 15. Children have time to play	Preschool environment	Recode (1 = Good quality, 0 = Minimal quality)	Not included	Independent variable	Not included

	freely in class 16. At least half of activity time are organised in small groups (children interact with each other, not with a teacher)					
Space and Furnishing	Composite score of the following items: 1. Indoor space is sufficient for all children 2. Has usable toilet 3. Has table and chair suit with preschool children 4. Sufficient toys are available for children. 5. There is a playground for gross motor play 6. There is access to drinking and usable water for children 6.1. Children bring drinking water from home	Preschool environment	Recode (1 = Good quality, 0 = Minimal quality)	Not included	Independent variable	Not included
Teacher and parent conference	17. Teachers meet with all parents at least once a month	Preschool environment	Recode (1 = Good quality, 0 = Minimal quality)	Not included	Independent variable	Independent variable

Teacher motivation regarding time spent	<p>The composite score of the following questions:</p> <p>44. About how many minutes per day do you spend preparing lessons in advance of the class?</p> <p>46. About how many hours per day do you spend correcting students' work?</p> <p>47.a. On a regular week at Preschool, how many total hours during the week do you spend on providing free remedial help to students outside of Preschool hours?</p> <p>47.c. On a regular week at Preschool, about how many total hours during the week do you spend on exchanging ideas or getting help from colleagues at this Preschool? and</p> <p>47.d. On a regular week at Preschool, about how many total hours during the week do you spend on communicating with parents or guardians?</p>	TMDT	Rescale to 0-100 and averaging	Not included	Not included	Not included
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Teacher motivation regarding the reason to be a teacher	<p>Composite score of the following answers to the question: 37. Why did you become a teacher?</p> <p>I enjoyed Preschool and my teachers and wanted to be like them, I love working with children and helping them learn and grow, I love the subjects that I teach (reading, math, science,..), and believe in the importance of education and wanted to help my community/country."</p>	TMDT	Rescale to 0-100 and averaging	Not included	Not included	Not included
Teacher motivation regarding absenteeism	34. In the last full working week at Preschool, how many days were you absent from the Preschool for any reason? Please mention days absent only in the past working week (total from 5 working days). (the number of absence days except for sick and training days) (reverse scaling)	TMDT	Rescale to 0-100 and averaging	Not included	Not included	Not included

Teacher motivation regarding positive belief	"Composite score of the following belief statements: 14) I am satisfied with my current teaching job. 15) Teachers should go home at the end of the Preschool day even if they have not finished all their work. (reversed scaling) 16) Teachers should only give extra help to students after Preschool if it is paid tuition. (reversed scaling) 17) I purchase my additional learning materials. 18) I make my additional learning materials."	TMDT	Rescale to 0-100 and averaging	Not included	Not included	Not included
Director_feedback_useful	25. How useful was the feedback received?	TMDT	Likert scale (1-4)	Not included	Not included	Not included
Director_visits	24. About how many times in the past year did your Preschool director visit your class to observe your lesson?	TMDT	Frequency (integer)	Not included	Not included	Not included
DoE_feedback_useful	29. How useful was the feedback received?	TMDT	Likert scale (1-4)	Not included	Not included	Not included

DoE_visits	28. About how many times in the past year did a DoE ECE person visit your class to observe your lesson?	TMDT	Frequency (integer)	Not included	Not included	Not included
DTMT_feedback_useful	27. How useful was the feedback received?	TMDT	Likert scale (1-4)	Not included	Not included	Not included
DTMT_visits	26. About how many times in the past year did a DTMT person visit your class to observe your lesson?	TMDT	Frequency (integer)	Not included	Not included	Not included
Mentorship	32. Are you participating in a mentorship program either as a mentor or mentee?	TMDT	Dummy (0= No, 1=Yes)	Not included	Not included	Not included
Number of students in class	16. How many students usually attend your class?	TMDT	Integer	Independent variable	Independent variable	Not included
Number of working days teacher was absent from preschool in the last week	34. In the last full working week at Preschool, how many days were you absent from the Preschool for any reason? Please mention days absent only in the past working week (total from 5 working days).	TMDT	Integer	Independent variable	Independent variable	Not included
PoE_feedback_useful	31. How useful was the feedback received?	TMDT	Likert scale (1-4)	Not included	Not included	Not included
PoE_visits	30. About how many times in the past year did a PoE ECE person visit your class to observe your lesson?	TMDT	Frequency (integer)	Not included	Not included	Not included
Teacher age	11. Age:	TMDT	Year	Independent variable	Independent variable	Not included

Teacher education background	12. What is the highest level of education you have completed?	TMDT	1= secondary, 2=high school, 3=university	Independent variable	Independent variable	Not included
Teacher gender	10. Gender of respondent	TMDT	1= female, 0= male	Independent variable	Independent variable	Not included
Teacher's confidence	1) With all the experience I have, there is very little new I can learn to improve my practice. 6) I'm so overwhelmed with classroom challenges and following the curriculum that it is too difficult for me to try anything new. 24) I do not manage stress well. 25) I often feel unsuccessful as a teacher. 29) Keeping students on-task is a challenge.	TMDT	Factor score which is classified to 1=Low, 2= Medium, 3=High	Independent variable	Independent variable	Not included
Teacher's experience in the current school (in year)	14. How many years have you been teaching at this Preschool?	TMDT	Year	Independent variable	Independent variable	Not included
Teacher's total working experience (in year)	15. How many total years of teaching experience do you have?	TMDT	Year	Independent variable	Independent variable	Not included
Type of preschool teacher	13. Type of teacher: Being a state preschool teacher	TMDT	1= permanent teacher (hired through education system), 0=community teacher (hired through commune system)	Independent variable	Independent variable	Not included

Time	Time of survey: endline		1=endline, 0= baseline	Independent variable	Independent variable	Independent variable
Treatment	Being a child or parent, or caregiver of a child in the intervention group		1= intervention, 0= comparison	Independent variable	Independent variable	Independent variable
Treatment * Time	The interaction term of treatment and time			Independent variable	Independent variable	Independent variable

ANNEX 3: RESULT OF T-TEST OF THE DIFFERENCES IN IDELA SCORES

Table A3-1. Results of T-Test for Total IDELA Scores

Group1	Group2	Mean1	estimate2	estimate	p	p.adj	p.adj. signif
Intervention baseline	Intervention endline	60.6	87.8	27.2	0.000	0.000	***
Comparison endline	Intervention endline	59.6	87.8	28.2	0.000	0.000	***
Comparison baseline	Intervention baseline	61.3	60.6	-0.7	0.664	1.000	ns
Comparison baseline	Comparison endline	61.3	59.6	-1.8	0.274	0.822	ns

Note: ns stands for not significant.

Table A3-2. Results of T-Test for Motor Development Domain

Group1	Group2	Mean1	Mean2	Difference	p	p.adj	p.adj. signif
Intervention baseline	Intervention endline	67.2	89.2	22.0	0.000	0.000	***
Comparison endline	Intervention endline	63.4	89.2	25.7	0.000	0.000	***
Comparison baseline	Intervention baseline	66.4	67.2	0.7	0.762	0.762	ns
Comparison baseline	Comparison endline	66.4	63.4	-3.0	0.236	0.472	ns

Note: ns stands for not significant.

Table A3-3. Results of T-Test for Emergent Literacy Domain

Group1	Group2	Mean1	Mean2	Difference	p	p.adj	p.adj. signif
Intervention baseline	Intervention endline	44.4	79.9	35.5	0.000	0.000	***
Comparison endline	Intervention endline	36.6	79.9	43.3	0.000	0.000	***
Comparison baseline	Intervention baseline	45.3	44.4	-0.9	0.588	0.588	ns
Comparison baseline	Comparison endline	45.3	36.6	-8.7	0.000	0.000	***

Note: ns stands for not significant.

Table A3-4. Results of T-Test for Emergent Numeracy Domain

Group1	Group2	Mean1	Mean2	Difference	p	p.adj	p.adj. signif
Intervention baseline	Intervention endline	46.3	89.5	43.3	0.000	0.000	***
Comparison endline	Intervention endline	52.2	89.5	37.3	0.000	0.000	***
Comparison baseline	Intervention baseline	45.2	46.3	1.0	0.5710	0.5710	ns
Comparison baseline	Comparison endline	45.2	52.2	7.0	0.0002	0.0006	***

Note: ns stands for not significant

Table A3-5. Results of t-test for social-emotional domain

Group1	Group2	Mean1	Mean2	Difference	p	p.adj	p.adj. signif
Intervention baseline	Intervention endline	50.2	83.4	33.2	0.000	0.000	***
Comparison endline	Intervention endline	50.3	83.4	33.1	0.000	0.000	***
Comparison baseline	Intervention baseline	53.0	50.2	-2.8	0.268	0.804	ns
Comparison baseline	Comparison endline	53.0	50.3	-2.6	0.271	0.804	ns

Note: ns stands for not significant.

ANNEX 4: RESULT OF DID MODEL WITH RANDOM AND FIXED EFFECTS: IMPACT OF INTERVENTION ON TOTAL IDELA SCORES

Variable	Overall IDELA	Motor development	Emergent Literacy	Emergent Numeracy	Social-emotional
Child's Characteristics					
Age (in year)	5.228*** (0.908)	9.573*** (1.416)	5.007*** (1.125)	5.353*** (1.163)	5.042*** (1.481)
Gender (1 = Girl, 0 = Boy)	2.312** (0.987)	3.147** (1.534)	3.625*** (1.211)	0.270 (1.253)	4.384*** (1.618)
Disability status (1 = With disability, 0 = Without disability)	-0.096 (2.016)	1.395 (3.138)	1.317 (2.482)	0.794 (2.567)	0.690 (3.300)
Child's attendance at school (1= Regular, 0 = Not regular)	3.239** (1.559)	6.638*** (2.426)	0.865 (1.920)	3.016 (1.985)	0.433 (2.552)
The duration that a child has been in this preschool (0= Less than a year; 1= One year and above)	5.441*** (1.455)	5.879*** (2.268)	4.566** (1.799)	6.528*** (1.859)	3.929* (2.376)
Household's Characteristics					
Socio-economic status					
<i>Low (reference)</i>					
Medium	0.575 (1.310)	-0.751 (2.040)	-0.056 (1.617)	0.946 (1.672)	2.569 (2.140)
High	1.631 (1.310)	0.502 (2.054)	2.691 (1.645)	1.615 (1.696)	4.474** (2.116)
Types of caregivers					
<i>Parent (reference)</i>					
Grandparent	-0.919 (1.533)	-2.037 (2.389)	0.006 (1.895)	0.054 (1.959)	-2.783 (2.502)
Other	1.503 (2.834)	2.119 (4.405)	3.421 (3.480)	0.416 (3.601)	3.652 (4.646)

Variable	Overall IDELA	Motor development	Emergent Literacy	Emergent Numeracy	Social- emotional
Number of children in the family	-0.430 (0.374)	-0.882 (0.583)	-0.390 (0.461)	0.376 (0.477)	-1.200** (0.612)
School's Characteristics					
Number of students in a class	0.075 (0.065)	0.057 (0.107)	0.112 (0.094)	0.083 (0.094)	0.061 (0.096)
Type of preschool teacher (1= permanent teacher (hired through education system), 0 = community teacher (hired through commune system))	-2.097 (4.244)	4.212 (6.898)	-2.019 (5.967)	-8.244 (6.020)	3.799 (6.523)
Teacher's experience in the current school (in year)	0.294** (0.117)	0.069 (0.188)	0.461*** (0.157)	0.329** (0.160)	0.584*** (0.180)
Teacher's total working experience (in year)	-0.169 (0.157)	-0.292 (0.264)	-0.268 (0.244)	-0.356 (0.242)	-0.558** (0.228)
Teacher educational level (1=completed high school & higher, 0=completed secondary school)	2.934 (2.532)	4.478 (4.149)	1.549 (3.636)	4.665 (3.657)	4.451 (3.830)
Teacher age in years	0.376** (0.160)	0.614** (0.262)	0.309 (0.229)	0.506** (0.230)	0.655*** (0.243)
Teacher gender (1 = Female, 0 = Male)	-1.667 (2.360)	0.798 (3.718)	-4.454 (3.000)	-0.430 (3.088)	0.496 (3.783)
Number of working days teacher was absent from preschool in the last week	0.180 (0.800)	-0.124 (1.297)	0.643 (1.106)	-0.524 (1.122)	-0.301 (1.228)
Level of teacher's confidence					
Low (reference)					
Medium	2.328 (2.015)	-3.083 (3.345)	3.293 (2.986)	2.239 (2.991)	-1.698 (2.984)
High	3.190 (2.262)	1.760 (3.624)	4.223 (3.012)	1.168 (3.077)	2.262 (3.521)

Variable	Overall IDELA	Motor development	Emergent Literacy	Emergent Numeracy	Social- emotional
Impact					
Time (0 = Baseline, 1 = Endline)	-7.146*** (2.543)	-7.890** (4.002)	-14.269*** (3.245)	0.650 (3.333)	-6.829* (4.097)
Experiment (0 = Comparison schools, 1 = Intervention schools)	0.261 (2.028)	4.400 (3.400)	-1.773 (3.149)	2.654 (3.115)	-1.473 (2.992)
RE. Learning Impact (Time*Experiment)	26.538*** (2.461)	19.290*** (3.917)	41.410*** (3.236)	31.595*** (3.308)	29.117*** (3.891)
Sample size	603	603	603	603	603
R2 Marg.	0.515	0.296	0.540	0.594	0.365
R2 Cond.	0.535	0.336	0.588	0.630	0.378
AIC	4690.2	5203.4	4935.2	4973.3	5259.9
BIC	4804.7	5317.8	5049.6	5087.7	5374.3
RMSE	11.46	17.78	14.00	14.50	18.85
Intra-class correlation	0.04	0.058	0.104	0.09	0.019
Likelihood ratio tests between null and full model (Chi- Squared, Df)	417.484*** 23	246.521*** 23	450.417*** 23	546.686*** 23	306.872*** 23

* p < 0.05, ** p < 0.01, *** p < 0.001

Note: The marginal r-squared considers only the variance of the fixed effects, while the conditional r-squared takes both the fixed and random effects into account. The random effect variances are actually the mean random effect variances; thus, the r-squared value is also appropriate for mixed models with random slopes or nested random effects (see Johnson 2014)

ANNEX 5: RESULT OF RANDOM AND FIXED EFFECTS MODEL: DETERMINANTS OF CHILDREN'S LEARNING AND DEVELOPMENT

Variable	Overall IDELA	Motor Development	Emergent Literacy	Emergent Numeracy	Social- Emotional
Child's Characteristics					
Age (in year)	4.669*** (0.933)	9.075*** (1.421)	4.528*** (1.154)	4.711*** (1.173)	4.445*** (1.501)
Gender (1 = Girl, 0 = Boy)	2.352** (1.010)	3.104** (1.554)	3.488*** (1.235)	0.593 (1.274)	4.424*** (1.658)
Disability status (1 = With disability, 0 = Without disability)	-0.722 (2.071)	0.487 (3.183)	0.855 (2.531)	0.042 (2.612)	-0.125 (3.395)
Child's attendance at school (1= Regular, 0 = Not regular)	3.773** (1.589)	6.901*** (2.440)	2.109 (1.945)	3.591* (2.004)	0.607 (2.598)
Time spent in the preschool (1 = 1 year and above, 0 = Less than 1 year)	4.594*** (1.513)	4.377* (2.318)	3.429* (1.856)	5.448*** (1.906)	3.230 (2.461)
Household's Characteristics					
Socio-economic status					
<i>Low (reference)</i>					
Medium	0.137 (1.371)	-1.369 (2.099)	-1.019 (1.683)	0.045 (1.727)	1.794 (2.228)
High	0.446 (1.411)	-1.329 (2.146)	1.000 (1.741)	-0.336 (1.775)	3.223 (2.252)
Types of caregivers					
<i>Parent (reference)</i>					
Grandparent	-1.158 (1.577)	-2.000 (2.414)	-0.370 (1.935)	0.123 (1.987)	-3.091 (2.558)
Other	1.977 (2.882)	2.128 (4.432)	3.500 (3.524)	0.521 (3.635)	3.912 (4.730)

Variable	Overall IDELA	Motor Development	Emergent Literacy	Emergent Numeracy	Social-Emotional
Number of children in the family	-0.493 (0.383)	-0.952 (0.589)	-0.446 (0.469)	0.276 (0.484)	-1.553** (0.628)
Home Learning Environment					
Quantity of reading materials at home					
Low (reference)					
Medium	3.603** (1.436)	6.059*** (2.204)	3.478** (1.759)	4.922*** (1.811)	5.413** (2.345)
High	2.334 (2.063)	3.338 (3.163)	3.746 (2.528)	3.914 (2.600)	6.328* (3.360)
Quantity of learning toys at home					
Low (reference)					
Medium	-0.408 (2.255)	-2.074 (3.468)	1.830 (2.757)	-1.020 (2.844)	0.895 (3.698)
High	-0.345 (2.181)	-0.819 (3.351)	0.906 (2.667)	0.068 (2.750)	0.618 (3.571)
Caregiver's engagement with child's learning at home					
Low (reference)					
Medium	5.599*** (2.085)	8.653*** (3.204)	4.850* (2.549)	5.131* (2.629)	4.187 (3.416)
High	5.501*** (1.991)	8.680*** (3.055)	5.999** (2.437)	6.694*** (2.510)	3.531 (3.249)
Caregiver's attitude toward children					
Low (reference)					
Medium	-5.364	-2.474	3.923	-7.273	0.904

Variable	Overall IDELA	Motor Development	Emergent Literacy	Emergent Numeracy	Social- Emotional
	(9.175)	(14.047)	(11.253)	(11.558)	(14.901)
High	-2.757	-0.379	5.266	-5.603	4.154
	(9.170)	(14.047)	(11.242)	(11.553)	(14.914)
Negative discipline against children					
Low (reference)					
Medium	-0.628	0.459	0.264	-0.365	-0.763
	(1.623)	(2.493)	(1.986)	(2.047)	(2.656)
High	0.955	-1.420	-0.039	0.397	1.928
	(1.703)	(2.617)	(2.083)	(2.148)	(2.788)
School Environment					
Quality of teaching, (1 = Good quality, 0 = Low quality)	11.131*** (3.367)	10.458** (4.319)	18.441*** (5.079)	9.953** (4.006)	12.198*** (3.889)
Language - Reasoning (1 = good quality, 0 = minimal quality)	-3.423 (4.759)	-3.166 (6.078)	0.702 (7.097)	-3.292 (5.663)	-4.718 (5.375)
Teacher and parent conference (1 = Once every two months or more, 0 = Once every three months or less)	4.926 (4.337)	2.197 (5.461)	4.970 (6.768)	1.322 (5.125)	4.614 (4.868)
Preschool curriculum structure (1 = good quality, 0 = minimal quality)	7.958** (3.485)	1.520 (4.754)	14.116*** (4.931)	8.301** (4.229)	3.818 (4.506)
Space and Furnishing (1 =good quality, 0 = Minimal quality)	5.967 (3.648)	4.899 (4.957)	3.988 (5.188)	12.481*** (4.422)	7.514 (4.687)
Number of students in a class	0.226** (0.115)	0.146 (0.146)	0.311* (0.175)	0.253* (0.136)	0.124 (0.129)
Number of working days teacher was absent from preschool in the last week	-1.814* (0.997)	-1.502 (1.405)	-3.302** (1.339)	-2.885** (1.225)	-1.815 (1.358)
Level of teacher's confidence					
Low (reference)					

Variable	Overall IDELA	Motor Development	Emergent Literacy	Emergent Numeracy	Social-Emotional
Medium	-5.312* (3.087)	-7.096* (3.941)	-13.386*** (4.785)	-5.663 (3.664)	-6.002* (3.548)
High	-3.505 (3.174)	-0.944 (4.361)	-7.916* (4.487)	-7.577** (3.856)	-3.436 (4.242)
Type of preschool teacher (0= permanent teacher (hired through education system), 1 = community teacher (hired through commune system))	10.941* (6.554)	14.940* (8.580)	25.007** (9.990)	4.857 (7.829)	13.568* (8.031)
Teacher's experience in the current school (in year)	0.217 (0.174)	0.071 (0.246)	0.437* (0.236)	0.339 (0.214)	0.420* (0.241)
Teacher's total working experience (in year)	-0.415 (0.269)	-0.564* (0.327)	-0.709 (0.447)	-0.634** (0.314)	-0.727** (0.282)
Teacher educational level (1=completed high school & higher, 0=completed secondary school)	-3.628 (4.256)	-0.584 (5.352)	-8.524 (6.891)	-0.564 (5.016)	-4.438 (4.831)
Age of teacher (in year)	0.343 (0.244)	0.605* (0.314)	0.414 (0.389)	0.473 (0.290)	0.413 (0.289)
Teacher gender (1 = Female, 0 = Male)	0.788 (3.585)	4.116 (4.928)	2.404 (4.993)	2.586 (4.361)	3.821 (4.735)
ECCD committee at school, achieved	-1.685 (2.636)	-3.305 (3.592)	-0.967 (3.752)	-2.726 (3.194)	2.460 (3.434)
Time and Experiment					
Time (0 = Baseline, 1 = Endline)	-4.002 (3.368)	-3.565 (4.919)	-12.391*** (4.448)	5.907 (4.172)	-2.983 (5.045)
Experiment (0 = Comparison schools, 1 = Intervention schools)	12.170*** (3.351)	12.198*** (3.789)	19.068*** (6.181)	15.201*** (3.818)	9.586*** (3.088)
Sample Size	603	603	603	603	603
R2 Marg.	0.522	0.324	0.524	0.604	0.375

Variable		Overall IDELA	Motor Development	Emergent Literacy	Emergent Numeracy	Social- Emotional
R2 Cond.		0.628	0.399	0.729	0.676	0.403
AIC		4677.0	5155.1	4914.1	4936.3	5222.6
BIC		4857.5	5335.6	5094.6	5116.8	5403.1
RMSE		11.30	17.43	13.77	14.26	18.67
Intra-class correlation		0.223	0.111	0.43	0.181	0.045
Likelihood ratio tests between null and full model (Chi- Squared, Df)		460.722***	324.762***	501.493***	479.271***	374.185***
		38	38	38	38	38

* p < 0.05, ** p < 0.01, *** p < 0.001

ANNEX 6: RESULT OF T-TEST OF THE DIFFERENCE IN HOME LEARNING ENVIRONMENT

Table A6-1. Results of T-Test for Overall Home Learning Environment

Group1	Group2	Mean1	Mean2	Difference	p	p.adj	p.adj.signif
Intervention_baseline	Intervention_endline	57	79.3	22.3	0	0	***
Comparison_endline	Intervention_endline	48.5	79.3	30.8	0.000	0.000	***
Comparison_baseline	Intervention_baseline	57.8	57	-0.9	0.639	0.639	ns
Comparison_baseline	Comparison_endline	57.8	48.5	-9.4	0.000	0.000	***

Note: ns stands for not significant.

Table A6-2. Results of T-Test for Reading materials at home

Group1	Group2	Mean1	Mean2	Difference	p	p.adj	p.adj.signif
Intervention_baseline	Intervention_endline	13	46.5	33.5	0	0	***
Comparison_endline	Intervention_endline	18.3	46.5	28.2	0	0	***
Comparison_baseline	Intervention_baseline	11.2	13	1.8	0.357	0.357	ns
Comparison_baseline	Comparison_endline	11.2	18.3	7.1	0	0.001	**

Note: ns stands for not significant.

Table A6-3. Results of T-Test for Learning toys at home

Group1	Group2	Mean1	Mean2	Difference	p	p.adj	p.adj.signif
Intervention_baseline	Intervention_endline	69.6	82.2	12.6	0	0	***
Comparison_endline	Intervention_endline	50.3	82.2	31.9	0	0	***
Comparison_baseline	Intervention_baseline	71.3	69.6	-1.7	0.469	0.469	ns
Comparison_baseline	Comparison_endline	71.3	50.3	-21	0	0	***

Note: ns stands for not significant.

Table A6-4. Results of T-Test for Caregiver's engagement with children's learning at home

Group1	Group2	Mean1	Mean2	Difference	p	p.adj	p.adj.signif
Intervention_baseline	Intervention_endline	66.1	85.8	19.7	0	0	***
Comparison_endline	Intervention_endline	60.4	85.8	25.4	0	0	***
Comparison_baseline	Intervention_baseline	67.8	66.1	-1.7	0.495	0.495	ns

Comparision_baseline	Comparision_endline	67.8	60.4	-7.4	0.014	0.041	*
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Note: ns stands for not significant.

ANNEX 7: RESULT OF DID MODEL WITH RANDOM AND FIXED EFFECTS: IMPACT ON HOME LEARNING ENVIRONMENT

Variable	Overall Home Learning Environment (PCA Score)	Reading Materials at Home (PCA Score)	Learning Toy at Home (PCA Score)	Learning Practice at Home (PCA Score)
Child's Characteristics				
Age (in year)	-0.091 (1.220)	-0.322 (1.310)	0.225 (1.418)	-0.704 (1.652)
Gender (1 = Girl, 0 = Boy)	0.634 (1.421)	1.723 (1.535)	-0.214 (1.655)	1.273 (1.926)
Disability status (1 = With disability, 0 = Without disability)	1.644 (3.021)	0.830 (3.258)	-0.058 (3.517)	7.652* (4.094)
Child's attendance at school (1= Regular, 0 = Not regular)	-3.844* (2.220)	-5.569** (2.393)	-3.777 (2.584)	-2.488 (3.008)
Time spent in the preschool (1 = 1 year and above, 0 = Less than 1 year)	4.630** (2.037)	5.955*** (2.196)	3.891 (2.371)	4.012 (2.761)
Household's Characteristics				
Socio-economic status				
Low (reference)				
Medium	9.754*** (1.831)	4.061** (1.967)	11.425*** (2.129)	6.034** (2.480)
High	8.232*** (1.910)	8.260*** (2.032)	8.164*** (2.215)	3.979 (2.584)
Types of caregivers				
Parent (reference)				
Grandparent	-0.200 (2.259)	2.487 (2.430)	-3.010 (2.628)	0.114 (3.061)
Other	-0.730 (4.178)	6.500 (4.513)	-3.170 (4.866)	-2.843 (5.663)

Variable	Overall Home Learning Environment (PCA Score)	Reading Materials at Home (PCA Score)	Learning Toy at Home (PCA Score)	Learning Practice at Home (PCA Score)
Number of children in the family	-0.031 (0.529)	0.742 (0.570)	-0.028 (0.615)	-0.382 (0.716)
Impact				
Time (0 = Baseline, 1 = Endline)	-13.149*** (3.183)	2.764 (3.431)	-24.667*** (3.705)	-12.166*** (4.313)
Experiment (0 = Comparison schools, 1 = Intervention schools)	1.014 (3.325)	2.213 (2.950)	0.220 (3.614)	1.568 (4.352)
R.E. Learning Impact (Time*Experiment)	25.457*** (2.890)	22.428*** (3.116)	27.021*** (3.364)	22.428*** (3.916)
Num.Obs.	682	682	682	682
R2 Marg.	0.276	0.348	0.235	0.134
R2 Cond.	0.352	0.383	0.300	0.216
AIC	5889.3	5985.3	6090.5	6294.4
BIC	5961.7	6057.7	6162.9	6366.8
RMSE	17.66	19.16	20.60	23.96
Intra-class correlation	0.105	0.053	0.085	0.095
Likelihood ratio tests (Chi-Squared, Df)	199.589*** 13	291.524*** 13	178.15*** 13	115.683*** 13

* p < 0.05, ** p < 0.01, *** p < 0.001

ANNEX 8: RESULT OF T-TEST OF THE DIFFERENCE IN PRESCHOOL QUALITY

Table A8-1. Results of T-Test for Total Scores of Classroom Quality

Group1	Group2	Mean1	Mean2	Difference	p	p.signif	Remarks
Comparison	Intervention	0.7	1.7	0.9	0.009	***	DID
Intervention baseline	Intervention endline	1.4	3.0	1.7	0.0000	***	
Comparison endline	Intervention endline	2.5	3.0	0.5	0.0810	*	
Comparison baseline	Intervention baseline	1.8	1.4	-0.4	0.0330	**	
Comparison baseline	Comparison endline	1.8	2.5	0.7	0.0090	***	

Note: ns stands for not significant.

Table A8-2. Results of T-Test for Spacing and Furnacing

Group1	Group2	Mean1	Mean2	Difference	p	p.signif	Remarks
Comparison	Intervention	0.3	1.2	0.9	0.0088	***	DID
Intervention baseline	Intervention endline	1.8	3.0	1.2	0.0001	***	
Comparison endline	Intervention endline	2.4	3.0	0.6	0.0250	***	
Comparison baseline	Intervention baseline	2.1	1.8	-0.4	0.0980	*	
Comparison baseline	Comparison endline	2.1	2.4	0.3	0.2130	ns	

Note: ns stands for not significant.

Table A8-3. Results of T-Test for Language and Reasoning

Group1	Group2	Mean1	Mean2	Difference	p	p.signif	Remarks
Comparison	Intervention	0.5	2.1	1.7	0.0006	***	DID
Intervention baseline	Intervention endline	1.1	3.2	2.1	0.0000	***	
Comparison endline	Intervention endline	2.4	3.2	0.9	0.0100	***	
Comparison baseline	Intervention baseline	1.9	1.1	-0.8	0.0100	***	
Comparison baseline	Comparison endline	1.9	2.4	0.5	0.1920	ns	

Note: ns stands for not significant.

Table A8-4. Results of T-Test for Interactions

Group1	Group2	Mean1	Mean2	Difference	p	p.signif	Remarks
Comparison	Intervention	0.9	1.8	0.9	0.0197	***	DID
Intervention baseline	Intervention endline	1.6	3.4	1.8	0.0000	***	
Comparison endline	Intervention endline	2.9	3.4	0.5	0.0930	*	
Comparison baseline	Intervention baseline	2.1	1.6	-0.5	0.1020	ns	
Comparison baseline	Comparison endline	2.1	2.9	0.9	0.0140	***	

Note: ns stands for not significant.

Table A8-5. Results of T-Test for Preschool curriculum structure

Group1	Group2	Mean1	Mean2	Difference	p	p.signif	Remarks
Comparison	Intervention	0.7	1.5	0.7	0.1070	ns	DID
Intervention baseline	Intervention endline	1.2	2.7	1.5	0.0002	***	
Comparison endline	Intervention endline	2.3	2.7	0.4	0.3220	ns	
Comparison baseline	Intervention baseline	1.6	1.2	-0.4	0.1380	ns	
Comparison baseline	Comparison endline	1.6	2.3	0.7	0.0300	**	

Note: ns stands for not significant.

Table A8-6. Results of T-Test for Parents and Education Staff's Relation

Group1	Group2	Mean1	Mean2	Difference	p	p.signif	Remarks
Comparison	Intervention	1.4	1.7	0.4	0.4860	ns	DID
Intervention baseline	Intervention endline	1.1	2.8	1.7	0.0003	***	
Comparison endline	Intervention endline	2.5	2.8	0.4	0.4660	ns	
Comparison baseline	Intervention baseline	1.1	1.1	0.0	1.0000	ns	
Comparison baseline	Comparison endline	1.1	2.5	1.4	0.0040	***	

Note: ns stands for not significant.

ANNEX 9: RESULT OF T-TEST OF THE DIFFERENCE IN TEACHER MOTIVATION

Table A9-1. Results of T-Test for overall teacher motivation

Group1	Group2	Mean1	Mean2	Difference	p	Remarks
Comparison	Intervention	-1.2	14.3	15.5	0.0031***	DID
Intervention baseline	Intervention endline	52.2	66.5	14.3	0.002***	
Comparison endline	Intervention endline	53.5	66.5	13.0	0.005***	
Comparison baseline	Intervention baseline	54.7	52.2	-2.5	0.553	
Comparison baseline	Comparison endline	54.7	53.5	-1.2	0.775	

Table A9-2. Results of T-Test for motivation regarding time spent

Group1	Group2	Mean1	Mean2	Difference	p	Remarks
Comparison	Intervention	-18.7	11.8	30.4	0.0176**	DID
Intervention baseline	Intervention endline	30.3	42.1	11.8	0.370	
Comparison endline	Intervention endline	15.2	42.1	26.9	0.023**	
Comparison baseline	Intervention baseline	33.9	30.3	-3.5	0.792	
Comparison baseline	Comparison endline	33.9	15.2	-18.7	0.113	

* p < 0.1, ** p < 0.05, *** p < 0.01

Table A9-3. Results of T-Test for motivation regarding reason to teacher

Group1	Group2	Mean1	Mean2	Difference	p	Remarks
Comparison	Intervention	22.2	45.0	22.8	0.1430	DID
Intervention baseline	Intervention endline	20.0	65.0	45.0	0.001***	
Comparison baseline	Intervention baseline	25.0	20.0	-5.0	0.657	
Comparison endline	Intervention endline	47.2	65.0	17.8	0.137	
Comparison baseline	Comparison endline	25.0	47.2	22.2	0.053*	

* p < 0.05, ** p < 0.01, *** p < 0.001

Table A9-4. Results of T-Test for motivation belief

Group1	Group2	Mean1	Mean2	Difference	p	Remarks
Comparison	Intervention	-9.3	-2.4	6.9	0.4260	DID
Intervention baseline	Intervention endline	61.6	59.2	-2.4	0.699	
Comparison endline	Intervention endline	51.6	59.2	7.6	0.301	
Comparison baseline	Intervention baseline	60.9	61.6	0.7	0.899	
Comparison baseline	Comparison endline	60.9	51.6	-9.3	0.182	

* p < 0.1, ** p < 0.05, *** p < 0.01

Table A9-5. Results of T-Test for motivation in time regarding the absence

Group1	Group2	Mean1	Mean2	Difference	p	Remarks
Comparison	Intervention	0.9	2.8	1.9	0.3770	DID
Intervention baseline	Intervention endline	96.8	99.6	2.8	0.174	
Comparison endline	Intervention endline	100.0	99.6	-0.4	0.343	
Comparison baseline	Intervention baseline	99.1	96.8	-2.3	0.284	
Comparison baseline	Comparison endline	99.1	100.0	0.9	0.347	

* p < 0.05, ** p < 0.01, *** p < 0.001



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