



Save the Children®

Early Literacy & Maths Initiative (ELMI)

Rwanda

Endline Report

June 2015



Executive Summary

Save the Children's Early Literacy and Maths Initiative (ELMI), a project supported by Innovation for Education, a partnership between the Governments of Rwanda and the UK, was initiated in Rwanda in early 2013. In recognition of the increased interest and commitment by the Government of Rwanda to increasing access to ECCD services, the project was designed to focus on the quality of service delivery as this relates to school readiness outcomes for children. Early literacy and maths (ELM) skills are essential components of quality education. Children need the opportunity and support to gain these skills during pre-primary years. Yet, given how new ECCD is in the country, there is a shortfall of resources, expertise and investment in supporting ELM teaching in Rwanda.

ELMI aims to demonstrate techniques that are pedagogically sound, scalable, and which will ensure that during the critical early years Rwandan children benefit from inclusive, effective teaching and learning opportunities that support ELM skills development at pre-primary level, and improve school readiness and long-term learning outcomes for young learners. This includes piloting the introduction of ELM-specific techniques for caregivers in existing Early Childhood Care and Development (ECCD) Centres as well as designing and piloting a new parent outreach component for parents in communities where children are not able to attend ECCD Centres. Evidence gathered through this project will enable Save the Children, the Rwandan Government and other relevant actors in this field to develop cost-effective, replicable models, which are appropriate for scale up to achieve maximum impact for children. To support learning and enable meaningful evidence of the project's results to be produced, a rigorous evaluation process was developed, commencing with a baseline assessment.

This endline report begins by outlining the background to the project and methodology applied to gather data, followed by the results of an assessment conducted in grade 1 of six and seven years old children who were followed longitudinally through three waves of data collection. The endline data collection sought to understand the gains in learning and development, with a specific focus on literacy and maths, of children who participated in the ELMI program between baseline (May 2013) and midline (September 2014) by evaluating the skills of these children after they have completed their first term of primary school system (April-May 2015) as compared to children who attended non-ELMI ECCD centres and those who didn't benefit from any form of ECCD services.

At endline 439 assessments were collected across the project, a substantial decrease from the baseline study. At endline only 53 percent of the original sample remained, which decreased the power to detect significant differences between groups and also points to one of the main challenges and limitations of this ambitious longitudinal study. Not all children surveyed at baseline or midline were able to be found at endline. At endline, we found children in Grade 1 (P1), Grade 2 (P2) and some who had either dropped out of Grade 1 or were still in an ECCD centre.

The report highlights a few key results specifically related to the learning of children for whom data was available over time and learning trajectories that could be observed. The findings demonstrate that children in the ELMI Centre and ELMI Parenting groups showed statistically significantly higher scores at

endline on both literacy and maths compared to children in the Non-ECCD control group. ELMI parenting children started off lowest across all groups on all domains at baseline and over time caught up almost entirely with their ELMI ECCD peers, closing the gap from baseline. Furthermore, we see that not only do the ELMI Centre and Parenting programmes produce strong learning gains on average, but these interventions are benefitting all families and children equally, regardless of socioeconomic status.

On the other side, when we look at the non-ECCD control group, we note that these children generally had more or less the same starting point as the ELMI ECCD group at baseline, yet over time we see them falling further behind. The data from this study showed that the gap between these children and their ECCD counterparts is widening as children enter the formal school system.

Despite gains in the ELMI group, however, looking at the literacy and maths outcomes of children at endline, data shows a concerning overall trend, mainly that gains between midline and endline are very modest, with less than half the gains we documented between baseline and midline (when ELMI Centre and Parenting children were part of the ELMI intervention). Literacy and maths scores across the groups are barely reaching 50%, confirming the fact that even in grade 1, children are still working on gaining what are considered foundational preschool skills and are not ready for more complex or sophisticated learning.

It is clear that the grade 1 experience of many children, especially those who enter early, is not marked by success and in fact might be spinning children into a negative downward trajectory. The findings of this study demonstrate that little learning of fundamental literacy and maths skills is happening in grade 1. Our data on classroom observations in Grade 1 also reiterate the need for further and serious attention to Grade 1 learning environments and the transitions of children between preschool and primary school. Classrooms generally appeared under-resourced with class sizes of 50+ children, higher than what would be considered optimal for learning.

Interestingly, we re-confirmed that ECCD centre quality matters even for endline scores. This suggests that children who attended high quality ECCD centres were not only better prepared for Grade 1, but also retained their advantage into Grade 1 and had double the gains of their peers who attended low quality ECCD centres.

This presentation of results is followed by a summary of the key conclusions from the study's findings and related policy implications and recommendations for the Government of Rwanda as they relate to the Government goals reflected in the Education Sector Strategic Plan and EDPRS2.

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Overview

The following report presents the results of an endline evaluation for six and seven year olds that participated in the Innovation for Education-funded ELMI project and in control groups. This section outlines the main questions investigated during this endline and provides background information about the project intervention. Section II presents information on what kinds of data were collected and information about the sample, including attrition. In Section III, we compare development and learning skills between the different groups in the study. Section IV investigates the school environment in terms of the classrooms the study children attended in grade 1 (even though these were not a focus of the ELMI program), and Section V outlines the background characteristics and classroom environments that may predict performance in grade 1.

The report seeks to answer three main questions:

1. What skills have children in each of the groups gained in terms of literacy, mathematics, and socio-emotional development since their entry into grade 1?
2. What factors, including the quality of primary learning environments, are correlated with the children's gains on the school readiness assessment at endline?
3. Overall, did the ELMI intervention meet the expected outcomes of the project?

Background

This report is the third in a series of studies and reports documenting the long term impact of the ELM initiative in Rwanda, aimed to support foundational early literacy and maths skills among preschool age children and prepare them for success in primary school. For a detailed description of the interventions implemented by Save the Children Rwanda, please refer to Annex I.

Baseline (June 2013) and Midline (September 2014) data collection efforts focused on documenting the immediate impact of the interventions. Previous reports also broke down the results according to group assignment and background factors, and offered recommendations for programme adjustments in light of the findings. A summary of the midline evaluation findings can be found in Annex II. The midline study was conducted at the end of the children's ECCD experience as the school year ended in October 2014. In this endline study, almost 8 months after the Midline data collection, we follow up with the children from our previous waves after they have entered Grade 1 in primary schools in the study districts. This report seeks to document children's academic progress over time and to demonstrate if children who participated in ELMI are able to retain their midline advantage in terms of literacy and maths skills into Grade 1.

In order to demonstrate the effectiveness of the ELMI approach in the short and long term, a comprehensive set of evaluation tools were developed and adapted to the Rwandan context prior to conducting the baseline study and used for the baseline to set appropriate benchmarks and for the midline assessment to measure the progress. At endline we extended some of the tools and replaced others with more appropriate instruments since children were no longer in preschool. Previous reports highlighted the comparison across four different groups (1) children who participated in the ELMI centre based program (2) children who benefited from the ELMI parent education program (3) children who

attended regular ECCD centres without additional ELMI support and (4) children who did not receive any ECCD support over the course of their preschool years. The same four groups of children are compared in the study looking specifically at their literacy, maths and socio-personal skills in Grade 1.

Overall, the three studies aimed to demonstrate the following outcomes, measured by the indicators in the following table:

Outcome	Indicators
Improved early learning environment and teachers' pedagogical practices supporting ELM skills	ECCD children's scores in school readiness assessment (disaggregated by gender and foundational skills domains)
	Non-ECCD children's scores in school readiness assessment, whose parents are being trained by the ELM initiative (disaggregated by gender and foundational skills domains).
	ECCD teachers' scores in classroom environment assessment (disaggregated by gender) ¹ .
	G1 children's scores in literacy and maths skills ²
Improved parenting practices in supporting ELM skills	Parents/caregivers' scores in home environment assessment (disaggregated by gender) ³ .
ELM approach included in revised GoR's ECCD curriculum	Evidence of inclusion of ELM in GoR's revised ECCD curriculum ⁴

Methodology

The evaluation design for the ELMI project involves a quasi-experimental study of children participating in each of the interventions (ELMI Centre and ELMI Parenting), and two types of control children – some who attended non-ELMI ECCD Centres and some with no exposure to any ECCD services.

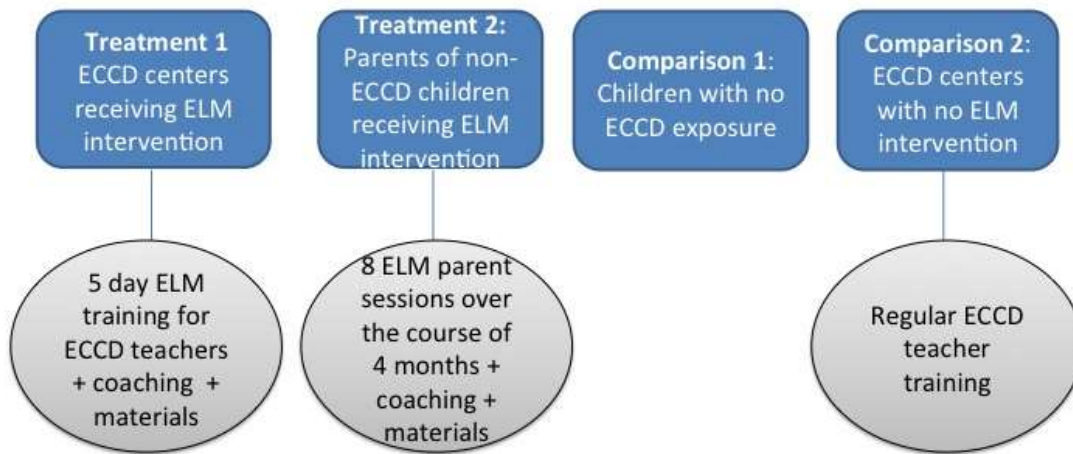
¹ This indicator measured only at baseline and midline.

² This indicator measured only at endline.

³ This indicator measured only at baseline and midline.

⁴ This indicator measured only at endline.

Summary of Intervention and Comparison Groups



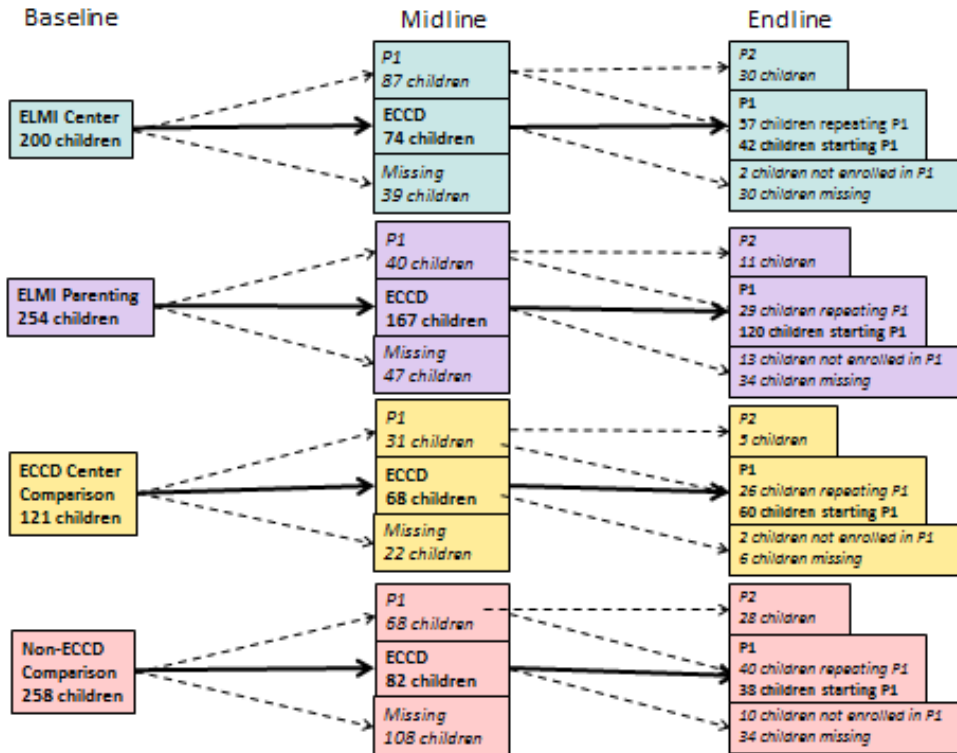
Twenty (25) enumerators⁵ were hired and trained by Save the Children staff for 5 days from 20 to 24 April, 2015. As all 25 enumerators were previously trained for the midline (20) and other similar evaluations (5), the training duration was shortened. The training was intensive and included not only guidance on the assessment administration but also issues of ethics and child safeguarding. Following this, a data collection process took place in the 4 districts of project implementation (on treatment and control groups). Under the guidance of the MEAL team, data collection was closely supervised by independent team leaders with ELMI project staff providing support and helping enumerators to find children in each district to ensure that data are reliable.

School readiness assessments were carried out primarily with children in primary school in over the course of 9 days from late April through mid-May 2015. As consent form was signed by each parent prior to the child assessment at the start of the project and a conversation to ascertain assent was held with each child prior to the assessment. The assessment tracked children that were assessed at baseline and midline in all the 4 groups.

At endline 439 assessments were collected across the project, a substantial decrease from the baseline study. At endline only 53 percent of the original sample remained, which decreases the power to detect significant differences between groups. Children who were not yet enrolled in P1 at midline were targeted for the endline study in order to directly measure learning gains for children who received the full intended interventions. Not all children surveyed at baseline or midline were able to be found at endline. At endline, we found children in Grade 1 (P1), Grade 2 (P2) and some who had either dropped out of Grade 1 or were still in an ECCD centre. A detailed description of the sample over time can be seen in Figure 1 below.

⁵ Although twenty enumerators were trained and began the data collection, one dropped out in the middle of data collection.

Figure 1. Study sample over time



In addition to direct child assessments, P1 school and classroom data were collected by the enumerators for all schools and classrooms in which children in the study were currently enrolled. The enumerators were trained on the classroom observation tool and discussed the interpretation of scoring for print materials and resources in the classroom. Classroom and school data was collected in lieu of the ECERS, which was the tool used at baseline-midline to account for preschool classroom level changes. At endline household data was not collected due to resource constraints and the perceived limited value of this collection given the fact that general background and socioeconomic data collected at baseline/midline was still relevant for the families who participated in the study. Data were collected using Tablets to minimized human errors through control checks built in the digitized questionnaires using Tangerine software. Data were uploaded on a daily basis and the MEAL Specialist checked data to give feedback to enumerators in the field.

Instruments

The endline data collection for this study intended to measure the children’s scores in literacy and maths after entering primary school. Thus, instruments employed in the study included tools that have been used in the baseline and midline assessments, as well as some new tools. Specifically, tools designed to measure P1 classroom quality were included at endline due to the strong connections found between ECCD classroom quality and child development scores in the midline assessment. In terms of the direct child assessment, some items previously included in the student assessment were dropped because they were no longer as developmentally appropriate for children in the study (i.e. children had

outgrown these items as they were almost 7 years old) and a few additional items were included to capture higher level skills that may have been gained since the beginning of Grade 1. All gross and fine motors items used at baseline and midline were excluded from the endline assessment because children were approaching mastery of these skills at midline. Three more advanced literacy items and two more advanced numeracy items were added to the endline assessment, as well as seven assessor observation items measuring approaches to learning (Cronbach's alpha = .99). A summary of the items included in the endline data collection are shown in Table 1, alongside the items administered at baseline and midline.

Table 1. Child assessment subtests and items included at baseline, midline and endline

	Baseline	Midline	Endline
Gross and Fine Motor			
Catching a ball	X	X	
Walking forward and backward	X	X	
Hopping	X	X	
Balancing on each foot	X	X	
String beads	X	X	
Folds paper into simple shapes	X	X	
Copy other words	X	X	
Draws shapes as per sample	X	X	
Cuts shapes	X	X	
Emergent Literacy			
Receptive vocabulary - Identifies actions when shown pictures	X	X	
Print awareness	X	X	X
Letter ID	X	X	X
Listening comprehension	X	X	X
Identify whether words rhyme	X	X	X
Writing	X	X	X
Expressive vocabulary	X	X	X
Story construction using picture cards	X	X	
Identify words that have similar beginning sounds	X	X	
Dictation			X
Most used words			X
Beginning sounds (harder item than the one administered at midline)			X
Emergent Numeracy			
Copying a pattern	X	X	
Rote counting	X	X	
Differentiates between left and right sides	X	X	
Concepts of quantity	X	X	
One criteria classification	X	X	
Identifying the one that is different	X	X	
Basic addition	X	X	X

	Baseline	Midline	Endline
Basic subtraction	X	X	X
Number identification and expression	X	X	X
Length	X	X	X
Puzzle competition	X	X	X
Backwards counting	X	X	X
Identifies shapes	X	X	X
Two criteria classification (sorting)	X	X	X
One-to-one correspondence	X	X	X
Quantity discrimination			X
Missing numbers			X
Socio-emotional Development			
Can express preferences	X	X	
Follows multi-step directions	X	X	
Solving conflict	X	X	
Perspective taking	X	X	X
Follows mixed instructions	X	X	X
Peer relationships	X	X	X
Recognizes own emotions	X	X	X
Self-awareness	X	X	X
Sharing with others	X	X	X
Personal strengths	X	X	X
Health and Hygiene			
Knows the critical times when hand washing is important	X	X	
Knows what is needed to wash hands	X	X	
Uses latrine/toilet at home	X	X	
Uses latrine/toilet independently	X	X	
Knows which foods are healthy and unhealthy	X	X	
Knows the critical times when brushing teeth is important	X	X	
Can explain why brushing teeth is important	X	X	
Knows what a bed net is used for	X	X	
Child sleeps under mosquito net	X	X	
Approaches to learning			
Persistence/motivation/concentration			X
Classroom /School Environment			
Observational scale at end of assessment	The Early Childhood Environment Rating Scale (ECERS)	The Early Childhood Environment Rating Scale (ECERS)	Teacher characteristics, classroom resources, print material displayed in classroom

As can be seen from the table above, at endline only a subset of the baseline/midline items were used since the children were in Grade 1 and were expected to have outgrown some of the easiest school readiness questions. For the purpose of comparing children's development and learning over time, child assessment scores displayed in this endline report represent only items that were used in all three data collections. Therefore, total scores displayed may differ from those seen in baseline and midline reports but are good representation of the children's learning over time.

To gain further insights into the findings, 4 interviews were conducted one in each district to corroborate the findings. The interviewees were purposively selected based on their exposure to project activities.

Additionally, to report on the last expected outcome regarding the inclusion of ELM in the revised pre-primary curriculum, the Save the Children Advocacy Specialist carried out a document review to inform the reporting against this indicator based on: 1) documentation of advocacy progress as noted in the project's Advocacy Monitoring and Reporting Tool, 2) analysis of the new curriculum following its publication, and 3) a comparison of content in the new curriculum with the previous ECD curriculum.

Sample

The intention of this endline data collection was to follow children from the four study groups into P1 and compare learning outcomes when these children were in their second term of primary school. Therefore, all children who were not enrolled in P1 at midline (either in ECCD or at home) and enrolled in P1 at endline are the main focus of this study. Children who were not enrolled in P1 at midline and were not found in P1 at endline were included in the assessment of child learning gains because although they have not transitioned to P1, they still received the full cycle of intervention (or control). Children who were enrolled in P1 at midline were tracked to learn about their progression to P2. However, documenting the learning gains for these children who enrolled in P1 early is not the focus of this study because, as discussed in the midline report, they received very little of the intended interventions due to the timeline of the activities.

Analysis

Information about enrollment and repetition of P1 for all groups will be presented, followed by learning gains for children who received the intended interventions, and then investigation of relationships between P1 learning environments and child learning. Learning gains will be presented for children who were present for the all three assessments, and will use only those items that are common across all three assessments. For these reasons, the average scores shown may differ from the scores shown in the baseline and midline reports, but for the purposes of tracking learning growth over time, following the same children and using the same assessment items is necessary. ANOVA tests with Tukey-Kramer post-hoc adjustment are used to determine significant differences between groups and three-level regression analyses are used to investigate relationships between school and classroom resources with child learning.

Results

This section outlines the results in relation to the expected outcomes and related indicators as agreed upon with the donor at the start of the project. Additional findings identified through the evaluation process are also presented. Some indicators have been presented in the midline report and are not relevant to the endline evaluation; the summary of findings from the midline have been annexed to this report. This endline report highlights gains over time, including the presentation of midline findings using items consistent across the three data collections, with focus on findings with respect to the last indicator on Grade 1 scores of children.

Literacy

We begin by looking at children's literacy skills in P1. Analyses find that overall children have not progressed very much between midline and endline. The area of most progress seems to be letter identification, indicating that in the first half of Grade 1, the main focus of learning is the alphabet. Children in all four groups made gains in letter recognition from midline to endline, with ELMI centre group showing the highest letter knowledge at endline, going from less than 2 letters at midline to 4 letters at endline. The ELMI parenting group doubled their letter knowledge as well (from 1.5 letters to roughly 3 letters), while the ECCD control and non ECD group went from knowing on average 1 letter at midline to knowing between 2-3 letters at endline. While the gains looks positive, this is still a very slow progress in alphabet recognition, especially considering that there is little movement across the rest of the literacy skills as well. At this rate of learning, by end of Grade 1 children in the most advantaged group (ELMI centre) would likely know barely 12 letters of the alphabet.

On average children show the most advanced skills in the areas of listening comprehension and of print awareness (with children answering more than half of the questions correctly), and the weakest skills in dictation and most used word identification. These were the hardest items that were added to the assessment at endline to avoid ceiling effects on the instrument but overall we don't see children ready for these skills, with less than 5% of children across the groups responding correctly to these items. In most countries by the end of grade 1 children are expected to identify and read simple, most used words, yet in Rwanda grade 1 students seem quite behind in this area, with about 3% of students across groups showing ability in this area by middle of Grade 1. Also concerning is that writing levels have barely improved across the groups and that expressive vocabulary seems to have remained stagnant between preschool and middle of grade 1, despite the significant jump in this skills area from baseline to midline in the intervention groups - this indicates that insufficient opportunities exist for speaking and growing vocabulary size in the early primary grades.

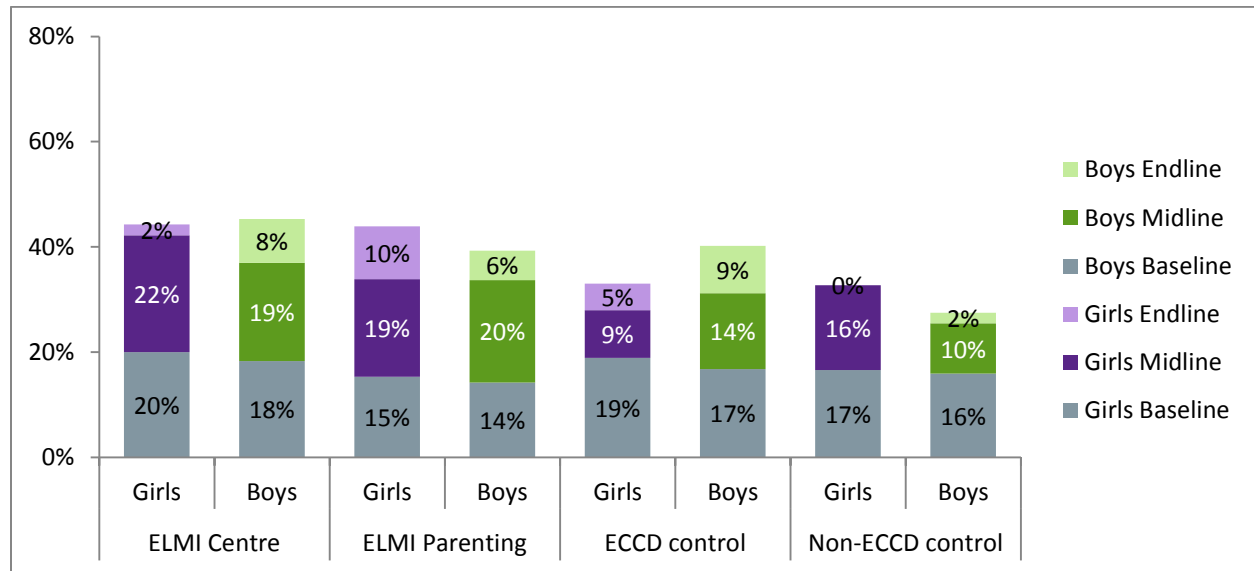
Nonetheless, despite the generally low gains across groups, at endline the ELMI Centre group showed the most advanced literacy skills at about 44% of correct responses compared to 42% of ELMI Parenting children, 36% for ECCD control and only 31% for the non ECCD children. This is quite encouraging for the ELMI initiatives implemented between baseline and midline. As can be seen from the table the ELMI Parenting group children actually gained more (8%) than their ELMI ECCD peers (4%) and almost caught up with them by endline. On the flipside, both control groups show concerning trends, with the non-ECCD control group barely gaining any new skills between midline and endline, falling further behind. There were no significant differences between boys' and girls' learning gains in any group.

Table 2. Emergent literacy skills at endline, by intervention group

	ELMI Centre (N=46)		ELMI Parenting (N=146)		ECCD control (N=64)		Non-ECCD (N=58)	
	Midline	Endline	Midline	Endline	Midline	Endline	Midline	Endline
Expressive vocabulary	45%	47%	31%	44%	32%	39%	36%	31%
Print awareness	43%	54%	43%	53%	42%	53%	36%	37%
Letter ID	9%	20%	7%	13%	3%	12%	3%	7%
Rhyming	32%	32%	22%	30%	15%	24%	15%	27%
Writing	53%	56%	42%	51%	37%	41%	37%	39%
Listening comprehension	55%	59%	55%	61%	47%	48%	48%	43%
Phonemic awareness	NA	5%	NA	15%	NA	9%	NA	4%
Dictation	NA	1%	NA	4%	NA	0%	NA	1%
Common words	NA	1%	NA	5%	NA	1%	NA	0%
Total Emergent Literacy	40%	44%	34%	42%	29%	36%	29%	31%

Looking at items common across all three assessments, skill growth over time can be examined. Data on skill gains over time show that children who participated in the ELMI Centre and ELMI Parenting program had some advantage at midline and retained and solidified this advantage at endline compared to the gains of children in the two comparison groups. The standard ECCD Centre and the Non-ECCD group, after controlling for baseline differences, seem to be falling further behind on literacy outcomes.. There were no significant differences between boys' and girls' learning gains in any group. And to reiterate the overall trend, it appears that even after a third of the way through grade 1, children are nowhere close to the high end of the early literacy competencies considered appropriate for end of preschool. On average we see scores hovering just below 50% and in the case of non-ECCD control children, even lower. This is a concerning trend, demonstrating that children have barely learned new things since their preschool years and graduation and putting into question the quality of instruction and support in grade 1.

Figure 2. Emergent literacy gains from baseline to endline, by gender and group



Maths

Turning to children's maths skills in P1, analyses demonstrate that overall, the trend seen with literacy gains is similar and unfortunately not very encouraging. On average, we see stagnant figures between midline and endline with very limited gains, primarily in the area of number ID and counting. Again it appears that children spent the first term of grade 1 primarily learning the names of numbers, with children in the ECCD control and non-ECCD groups (who started with the lowest maths knowledge at midline) more than doubling their knowledge of numbers and going from knowing about 2 numbers to knowing 5+ numbers at endline. ELMI Centre children show the most advanced number sense with being able to identify almost 9 numbers at endline, and close behind them are their ELMI parenting peers with knowing between 6+ numbers at endline.

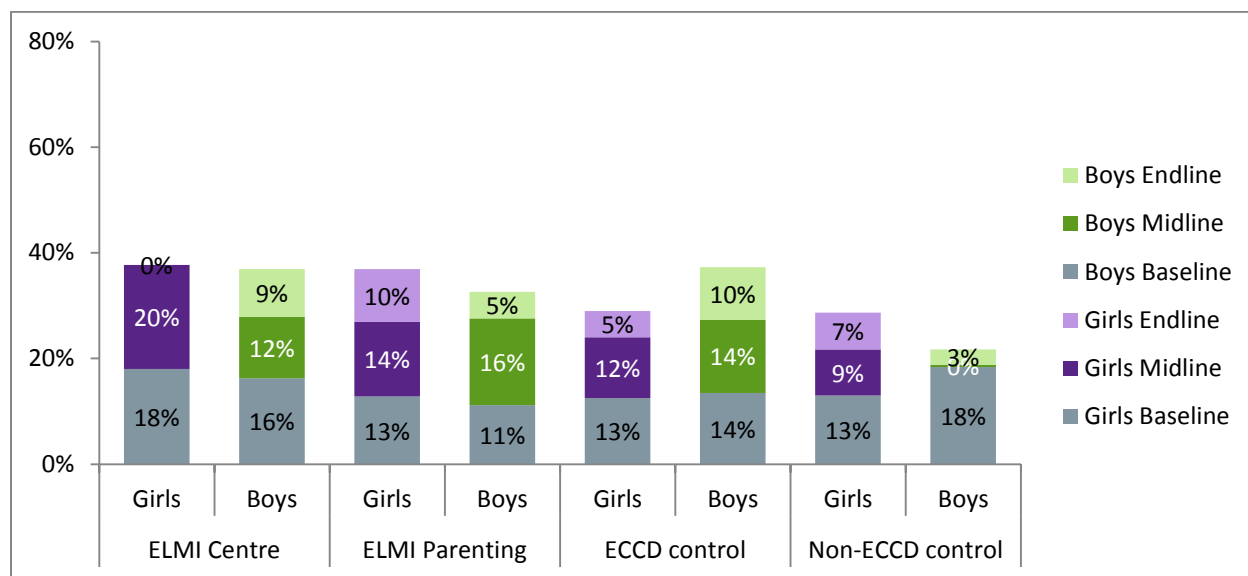
Overall, we see that children show the most advanced skills in the area of size/length comparisons (the easiest item on the assessment) and the weakest in problem solving items as well as the new, harder items added to the assessment. Not very much learning has happened in terms of spatial awareness and shape identification, or problem solving as assessed by puzzle or pattern completion. In fact, in the absence of practicing these skills in grade 1, ELMI Centre group (which had the strongest skills in these areas across the groups) decreased their knowledge in shapes and patterns. The data show that Grade 1 is a time of not necessarily extending children's learning but rather a time for getting all kids on more or less the same page with number recognition and counting, at the expense of skills such as problem solving, and more advanced skills, such as simple operations, which are expected to be the focus of Grade 1 but does not seem to be the case here.

Table 3. Emergent numeracy skills at endline, by intervention group

	ELMI Centre (N=46)		ELMI Parenting (N=146)		ECCD control (N=64)		Non-ECCD (N=58)	
	Midline	Endline	Midline	Endline	Midline	Endline	Midline	Endline
Size/length	81%	81%	77%	78%	79%	73%	76%	66%
Shape ID	53%	38%	37%	38%	38%	39%	33%	33%
Number ID	32%	42%	17%	31%	10%	27%	12%	20%
One-to-one correspondence	48%	57%	39%	61%	38%	51%	26%	37%
Back counting	25%	26%	19%	28%	15%	28%	10%	18%
Day/time	27%	32%	21%	30%	28%	27%	19%	20%
Pattern completion	28%	9%	18%	9%	9%	16%	7%	10%
Simple operations	17%	19%	15%	23%	15%	24%	9%	12%
Puzzle completion	20%	27%	16%	17%	10%	14%	10%	15%
Number discrimination	NA	29%	NA	24%	NA	18%	NA	18%
Missing numbers	NA	8%	NA	6%	NA	4%	NA	5%
Total Emergent Numeracy	34%	37%	27%	35%	26%	33%	20%	26%

On average, the group with the most concerning results is the Non-ECCD control group, where children appear to be scoring lowest at endline with only 26% correct responses, especially the boys. Children in the ELMI Centre group began with an advantage at midline and although they gained less than their peers from the ELMI Parenting group, they retained their overall advantage at endline with 37% correct vs 35% correct for ELMI Parenting. ELMI Parenting group actually gained the most between midline and endline (8%) which is interesting to see, and on items such as one-to-one-correspondence the ELMI parenting group surpassed the ELMI centre group at endline. As in literacy, early maths is still an area where a lot more skill growth is needed. Again it is surprising to see children barely reaching the 40 % of correct responses after a third of grade 1. There were also no significant differences between boys' and girls' learning gains in any group, but we do see a trend of boys falling sharply behind specifically in the non-ECCD control group.

Figure 3. Emergent Maths gains from baseline to endline, by gender and group



Socio-emotional development

In contrast to emergent literacy and maths, at endline children in all groups showed relatively strong and almost equally developed socio-emotional skills, with the exception of the non-ECCD control group, which showed the lowest overall scores at endline. The highest scores are seen in the skill areas of self-awareness and empathy. It is interesting to see growth in peers and friends across all groups, showing a new level of comfort and maturity to maintain friendships in grade 1. Empathy and conflict resolution skills also improved across all four groups.

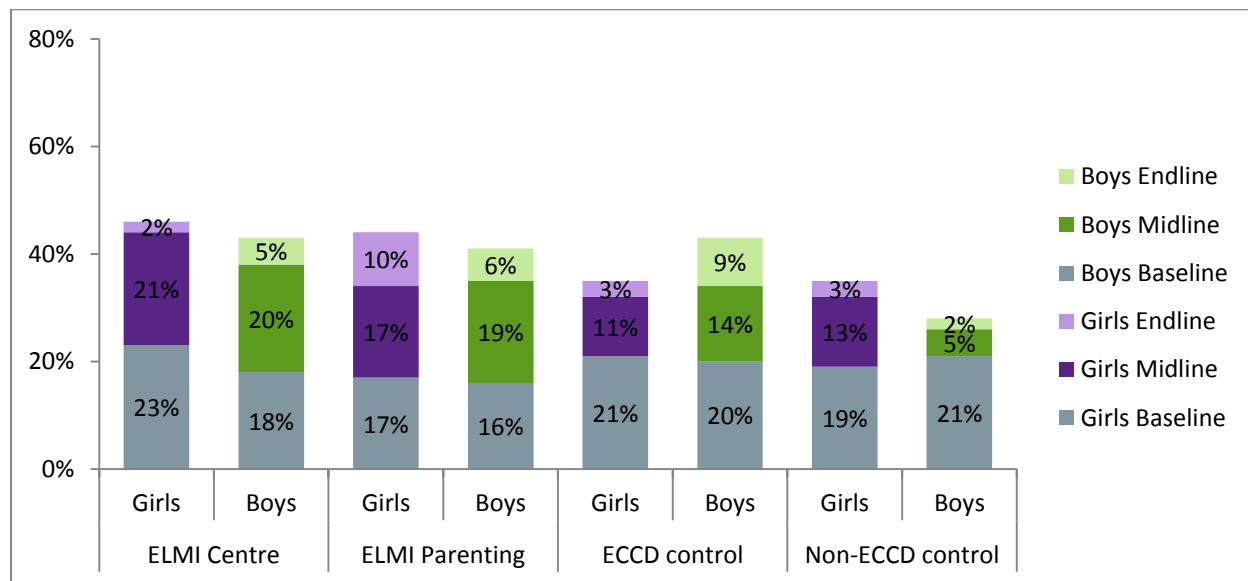
Table 4. Socio-emotional skills at endline, by intervention group

	ELMI Centre (N=46)		ELMI Parenting (N=146)		ECCD control (N=64)		Non-ECCD (N=58)	
	Midline	Endline	Midline	Endline	Midline	Endline	Midline	Endline
Self-Awareness	57%	66%	60%	70%	72%	67%	55%	54%
Peer relations	27%	44%	22%	44%	20%	38%	18%	36%
Personal Strengths	40%	41%	32%	35%	29%	32%	33%	31%
Self-emotions	54%	53%	48%	53%	38%	44%	29%	34%
Empathy	49%	68%	44%	64%	36%	59%	37%	42%
Conflict resolution/sharing	45%	48%	43%	47%	32%	45%	29%	35%
Total Socio-emotional development	50%	53%	43%	52%	41%	47%	36%	39%

Looking at socio-emotional skill gains over time data show that children in the ELMI Centre and ELMI Parenting programs are almost on par with their skills at endline, with ELMI Parenting group quickly

catching up with the midline advantage that the ELMI Centre group had. The ELMI Parenting group gained on average the most between midline and endline (9%) vs. 3% for ELMI ECCD children, 6% for the ECCD controls and 3% for the non-ECCD control, after controlling for baseline differences between groups. The non-ECCD group gained the least over time solidifying their disadvantage compared to other groups. There were no significant differences between boys' and girls' learning gains in any group, though again we see a trend of boys in the non-ECCD control group and that girls in the ECCD control group gaining the least of all groups. Compared to gains made between baseline and midline, the additional gains from midline to endline appear rather low. As with literacy and maths, there is substantial room for growth in this domain, even in grade 1, but the progression is generally positive and the average scores are hovering close to 50%.

Figure 4. Socio-emotional gains from baseline to endline, by gender and group.



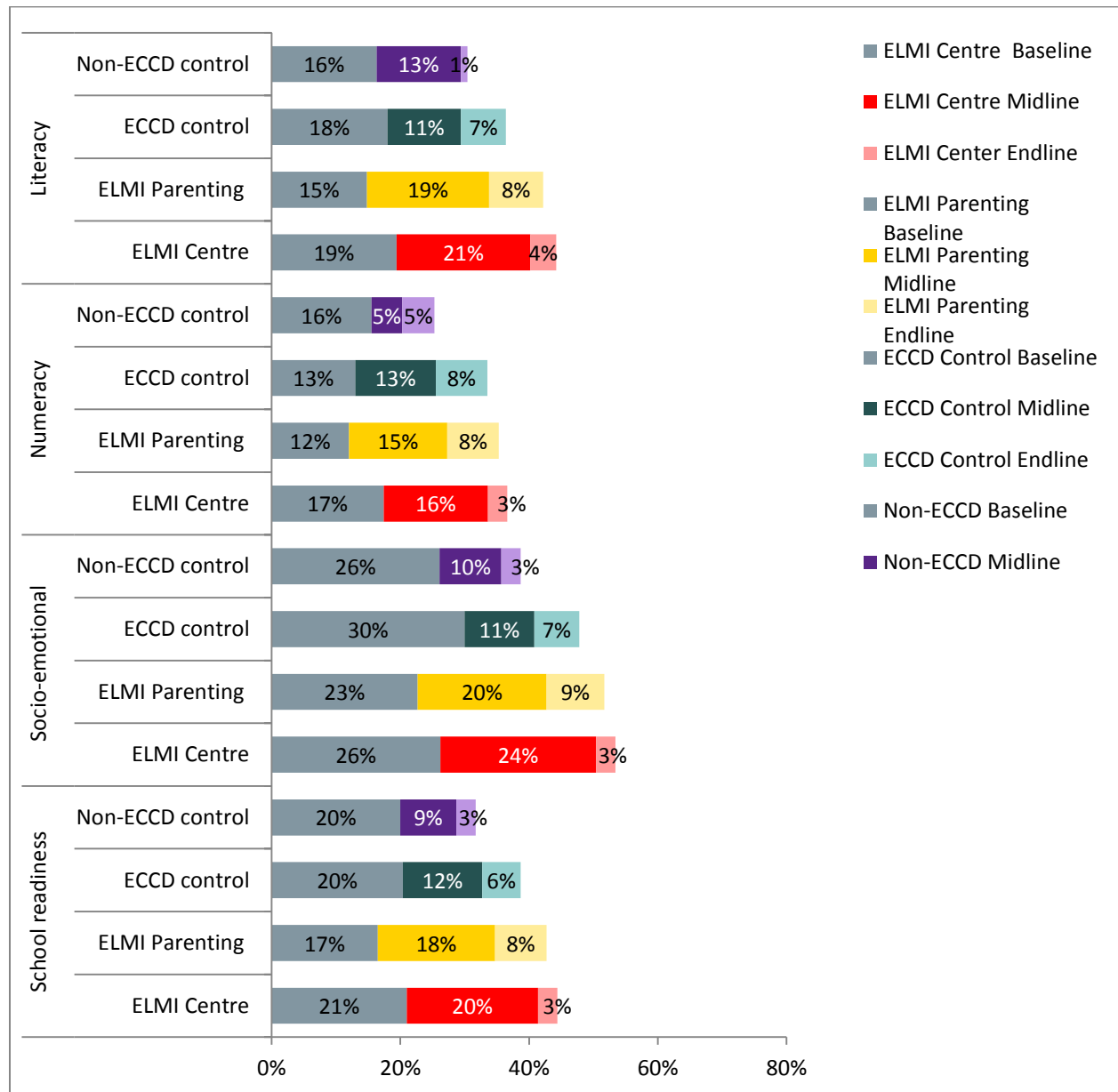
Total School Readiness Skills

Looking at all items together over time for children who participated in all three assessments data display similar trends to what we observed with the domain-specific scores. Gains between midline and endline are very modest, and children are certainly not reaching even 75% of correct responses on the instrument, confirming the fact that even in grade 1, children are still working on gaining what are considered foundational preschool skills and are not ready for more complex or sophisticated learning. Certainly this has strong implications for future programming in both preschool and grade 1. Either grade 1 curriculum and instruction is not well aligned with children's skills and competencies or factors such as large class sizes, different ECCD backgrounds and home experiences are contributing to the overall stagnant trajectories of learning.

Still, children in the ELMI Centre and ELMI Parenting groups showed statistically significantly higher scores at endline compared to children in the Non-ECCD control group. ELMI Centre children made significantly stronger gains than children in the ECCD comparison group, controlling for baseline scores. A few interesting trends are worth noting. The figure below clearly demonstrates ELMI parenting

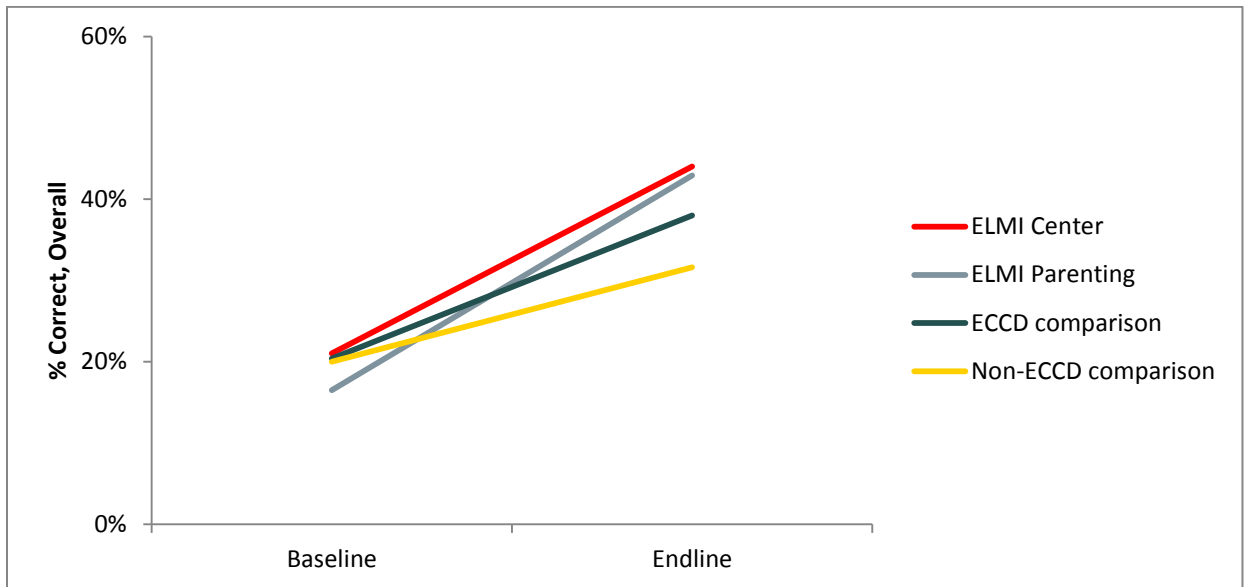
children starting off lowest across all groups on all domains and over time catching up almost entirely with ELMI ECCD peers, closing the gap from baseline. In fact the ELMI Parenting group continued to gain skills between midline and endline at a higher rate than the rest of the group, which is extremely positive. **Gains made by children in the ELMI Centre and ELMI Parenting groups are not significantly different from one another at endline.**

Figure 5a. Summary early learning gains from baseline to endline, by group



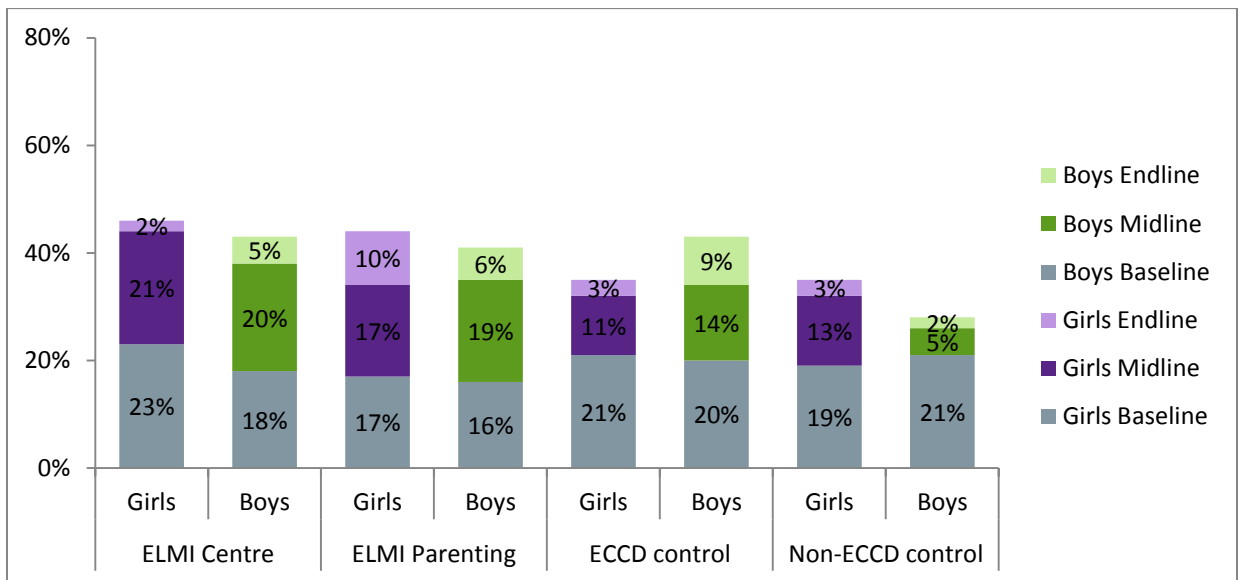
The opposite trend appears to be true for the non-ECCD control group, as seen in Figure 5b below. These children generally had more or less the same starting point as the ELMI ECCD group, yet over time we see them falling further behind. The figure clearly shows that the gap between them and their ECCD counterparts is widening as children enter the formal school system.

Figure 5b. Summary early learning gains from baseline to endline, by group



As we have seen in the previous domain specific sections, when we consider the average scores across the domains, there were no significant differences between boys' and girls' learning gains in any group. However, it does appear that boys in the non-ECCD control group and girls in the ECCD control group are particularly behind in their learning and development compared to all the other groups.

Figure 6. Overall early learning gains from baseline to endline, by gender and group



Approaches to Learning

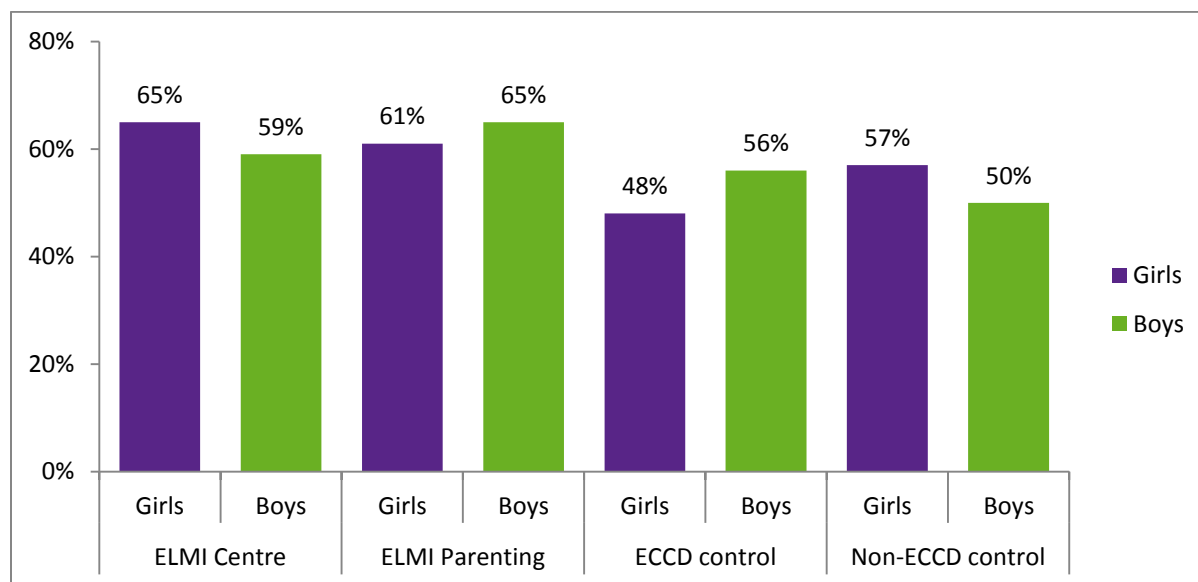
One of the new elements of the endline assessment was a more comprehensive measure of children’s approaches to learning, or the way they approach complex problems and tasks. Approaches to learning has been shown in other studies to determine children’s success in later primary school as children are likely to encounter harder problems and more challenging learning situations. Imagine a crowded, under resourced primary classroom, with a teacher who is trying to address varied learning needs and one who quickly recognizes the value of self-motivation and persistence to learn in the absence of focused individual support.

On average, children in the ELMI Centre and ELMI Parenting group showed significantly higher results in this area compared to children in the ECCD control and non-ECCD groups. This is a positive finding in favor of meaningful and quality ECCD experience which can foster stronger motivation, persistence and concentration on specific tasks much after the preschool years. No differences between boys and girls were documented.

Table 5. Approaches to learning skills at endline, by intervention group

	Range	ELMI Centre	ELMI Parenting	ECCD comparison	Non-ECCD comparison
a) Did the child pay attention to the instructions and demonstrations throughout the assessment?	0-4	2.7	2.7	2.1	2.2
b) Did child show confidence when completing activities; did not show hesitation.	0-4	2.4	2.4	2.0	2.0
c) Did the child stay concentrated and on task during the activities and was not easily distracted?	0-4	2.6	2.6	2.1	2.4
d) Was child careful and diligent on tasks? Was child interested in accuracy?	0-4	2.4	2.5	2.0	2.1
e) Did child show pleasure in accomplishing specific tasks?	0-4	2.4	2.4	2.1	2.1
f) Was child motivated to complete tasks? Did not give up quickly and did not want to stop the task?	0-4	2.6	2.6	2.0	2.2
g) Was the child interested and curious about the tasks throughout the assessment?	0-4	2.5	2.5	2.1	2.1
Total Approaches to learning (% correct)	0-1	63%	63%	52%	54%

Figure 7. Approaches to learning scores at endline, by gender and group

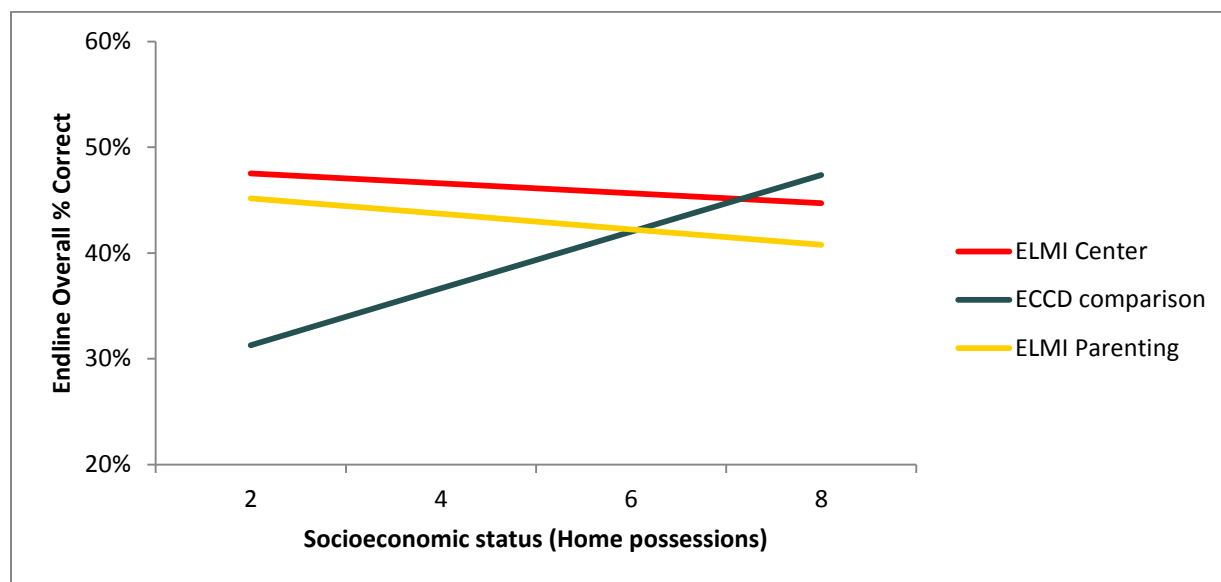


These findings of gains seen in ELMI children have been corroborated with qualitative feedback, as documented through some examples gathered highlighted in Annex III.

Equity in learning gains

Using caregiver information collected during the baseline assessment we were able to investigate the equity of children’s learning gains between baseline and endline. Overall, analyses find almost no key background characteristics (i.e., age, gender, mother education, socioeconomic status, and home learning environment (HLE)) significantly related to learning gains for children in the ELMI Centre or ELMI Parenting groups. **This suggests that not only do the ELMI Centre and Parenting programs produce strong learning gains on average, but also that these interventions are benefitting all families and children equally. In contrast, analyses find that after controlling for the background characteristics listed above girls in the ECCD Centre comparison group learn significantly less than boys in all skill areas. Also, within the ECCD Centre comparison group children with higher socioeconomic status are learning more than their peers with fewer family resources.** Further, we see that children in the ELMI Parenting group with more print material at home gained more than their peers with fewer literacy resources.

Figure 8. Learning gain differences by socioeconomic status



Enrollment and Repetition in P1

Over the course of this project we have been able to follow children’s progress toward enrollment in primary school. Interestingly, at midline we found that many children were enrolling in P1 earlier than anticipated. Overall, 37 percent of children from the baseline sample enrolled in P1 early, and of those who were found at endline, 70 percent were repeating their P1 year⁶. Looking at the children who entered Grade 1 on time (as expected based on their age), statistical tests confirm that children in the ELMI Parenting group were the most likely to be enrolled in P1 for the first time at endline, as expected.

Table 6. Study sample over time

	Baseline sample	Midline sample not in P1	Midline sample in P1	Total Midline sample	Children in P1 for the first time at endline	Children repeating P1 at endline	Children still in ECD/at home at endline	Children in P2 at endline	Missing at endline
ELMI Centre	200	74	87	161	42	57	2	30	30
ELMI Parenting	254	167	40	207	120	29	13	11	34
ECCD control	121	68	31	99	60	26	2	5	6
Non-ECCD control	258	82	68	150	38	40	10	28	34
Total	833	391	226	617	260	152	27	74	104

⁶ Overall, 216 children from the initial baseline sample were missing from the midline assessment and 104 from the endline sample.

At midline we determined that ELMI centre children have the highest rate of early school enrollment compared to the rest of the groups (at 54% of the initial sample moving up grade 1 earlier than anticipated). At endline, in terms of repetition, the trend is very concerning – of the children who enrolled in grade 1 early, an average of 70% were found in Grade 1 again at endline (rather in progressing to Grade 2). Across the groups, the trend we saw was repetition rates as high as 84% for the ECCD centre group of children who entered Grade 1 early. These statistics are distressingly high, particularly compared to an already high national average of 18.3% primary repetition rate⁷ in 2013. The cost of grade repetition is high, especially when the rates are so dramatic. It is clear that the grade 1 experience of many children is not marked by success and in fact might be spinning children into a negative downward trajectory. This finding also has important policy implications as early grade 1 entry does not appear beneficial to children’s learning and progress over time.

School environment

Now that children are making the transition to P1, it is also important to consider the quality of the primary school environment and how that impacts children’s continued learning and development⁸. Care was taken to collect this information at endline given the strong connection found between centre quality and children’s school readiness scores at midline.

Looking at information about teachers across districts many similarities are seen and some trends that may help explain the low achievement rate in Grade 1 by children. For example, while teachers generally seem to have a good level of teaching experience, class sizes seem to range between 50-60 students, which is quite high for the level of support and attention these young students need to ensure some learning is actually happening. Further, when we look at availability of textbooks, which is very much linked to how closely children are able to follow the teacher, we see in some instances just 30% of the children having a textbook in class. Similarly on the question if children brought textbooks home last night, we see even lower %, indicating that in most instances less than 30% of the students are doing homework or reviewing material at home.

⁷ According to the 2014 National Education Statistics as reported by MINEDUC at the Joint Review of the Education Sector, June 2015.

⁸ Note that the ELMI project didn’t intervene in P1 classrooms; this data was collected to enable analysis on the relationship of classroom quality to children’s learning.

Table 7. Classroom characteristics by district

	Burera (N=35)	Gicumbi (N=6)	Rubavu (N=24)	Ruhango (N=33)
Teacher is female	57%	71%	78%	97%
Teacher education (2=Secondary)	2.1	2.0	2.1	2.1
Years at school	6.0	5.9	5.9	6.7
Years of experience	7.9	7.3	8.3	8.1
Teacher age	39.3	32.7	40.5	39.6
Government teacher	97%	100%	100%	100%
Boys enrolled in class	25.2	26.2	30.5	25.8
Girls enrolled in class	25.1	25.9	30.3	23.5
Total class size	50.3	52.1	60.8	49.3
Boys present in class	23.0	20.7	22.4	20.2
Girls present in class	22.8	16.3	23.0	18.6
Total class present	45.9	37.0	45.4	38.9
# children with textbooks	30.7	34.4	53.7	40.9
# children who brought textbooks home last night	12.4	29.2	24.4	35.7
Blackboard is clean and visible	100%	100%	100%	99%

In addition to a teacher questionnaire, assessors also observed the amount and diversity of print materials in the classrooms they visited. Overall, teacher-made materials are the most commonly found in P1 classrooms and maps are the least common. Classrooms in Burera have significantly more print material displayed in classrooms than other districts. However, on average we see a real paucity of print materials in the classrooms, especially lack of student work, pictures or illustrations. These data present real challenges facing grade 1 students and teachers and put in perspective the overall lack of learning gains in the first third of the semester.

Table 8. Print materials in classrooms by district

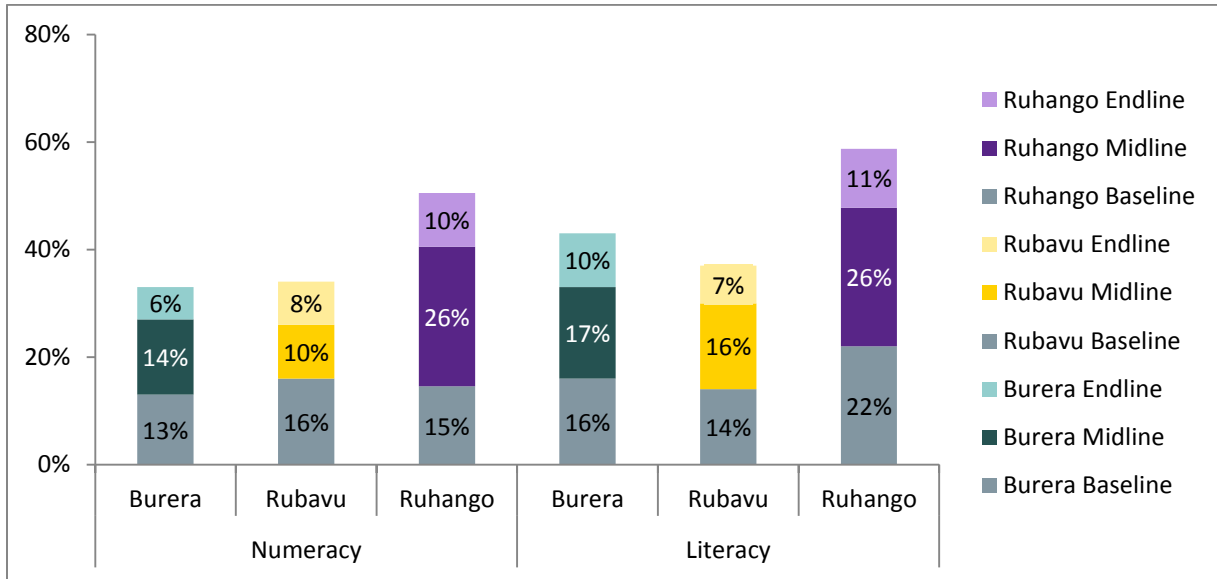
	Burera (N=35)	Gicumbi (N=6)	Rubavu (N=24)	Ruhango (N=33)
Professionally printed materials (0=none, 3=A lot)	1.7	0.6	0.6	0.9
Teacher made materials	2.4	2.1	1.9	1.2
Examples of student work	0.1	0.8	0.0	0.0
Numbers (number sequence)	1.5	1.0	1.4	0.6
Colour names (e.g. red, blue, yellow, etc)	0.5	0.3	0.1	0.2
Months of the year or days of the week	0.4	0.0	0.0	0.0
Class rules/code of conduct	0.3	0.0	0.2	0.0
Calendar	0.1	0.0	0.0	0.1
Pictures/illustrations/drawings	1.0	0.5	0.0	0.2
Words matched to pictures	1.9	1.4	1.4	0.3
Alphabet (letter sequence)	1.4	0.8	1.1	0.5
Maps	0.0	0.0	0.0	0.0
Wall materials in Kinyarwanda	2.3	1.0	1.1	0.4
Wall materials in another language (English)	1.0	1.2	1.2	0.3
Total Print materials (out of 45)	14.6	9.6	8.9	4.6

Connection between school quality and learning

Collecting student and school level information allows us to look at connections between children’s learning and their school environment. In this study, there were no significant relationships found between school resources (e.g., running water, distance from road, school library, etc.) or teacher characteristics (e.g., years of experience, education, etc.) and child learning from midline to endline. Also, there was no correlation between the amount of print material in a classroom and learning gains. That is not to say that these factors are not important drivers of school quality, simply that with the data available and tools used no connections were found in this study. The strongest relationship seen between school environment and child learning from midline was the number of textbooks found in a classroom, which is positively related to learning gains in literacy and numeracy. There was no differential impact of textbooks on midline-endline learning gains for children from different intervention groups.

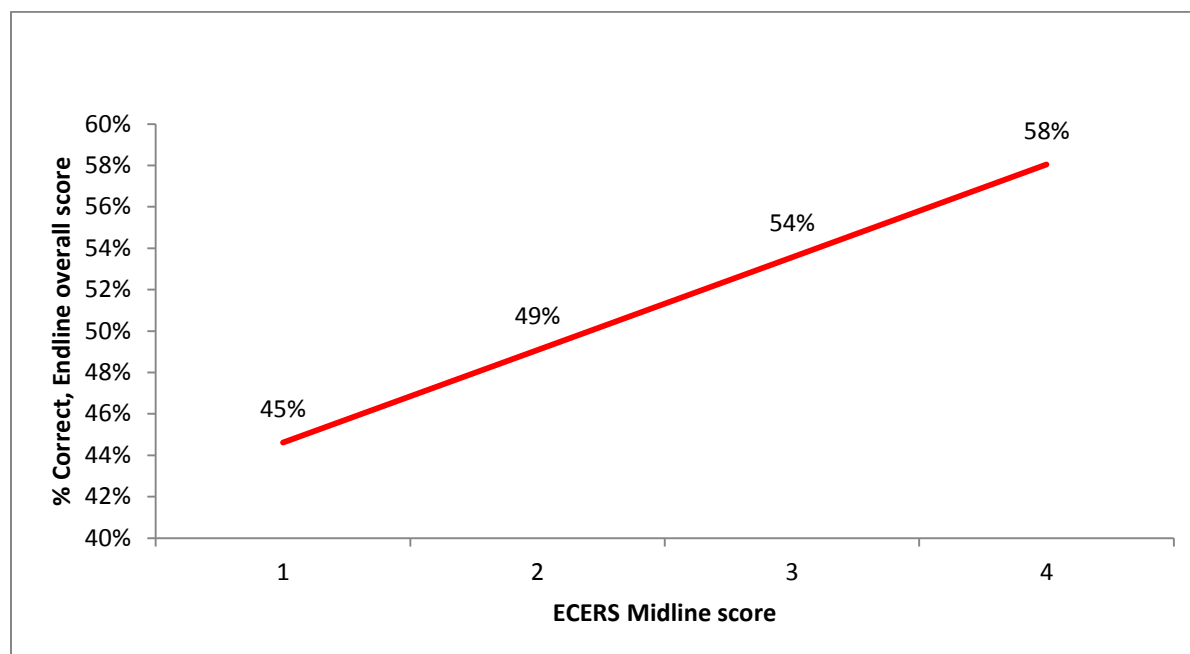
Looking descriptively at learning gains by district for children in intervention groups, data show relatively stronger gains for children in Ruhango from baseline to midline, but no significant differences exist between groups from midline to endline. Information for Gicumbi is not shown here because there were fewer than 10 children in an intervention group in that district at endline.

Figure 9. Learning gains by district, ELMI Centre and ELMI Parenting intervention groups only



Looking back at ECCD centre quality at midline, and the centres that children attended we see a continued significant relationship between higher ECERS scores at midline and stronger overall learning gains from midline to endline for ELMI Centre children. This suggests that children who attended high quality ECCD centres were not only better prepared for Grade 1, but also retained their advantage into Grade 1 and had double the gains of their peers who attended low quality ECCD centres. This represents only a small group of students and ECCD centres so future studies should continue to build on this work.

Figure 10. ECERS Midline scores predicting learning gains from midline to endline: ELMI Centre only



ELMI and Influencing the Rwandan pre-primary curriculum

The third expected outcome of the ELMI project - *ELM approach included in revised GoR's ECD curriculum* - was the inclusion of ELM in the revised GoR ECCD curriculum. As a national curriculum review was launched in 2013, which included a new curriculum for Pre-Primary, Save the Children focused our efforts on ensuring that the new curriculum incorporated a strong emphasis on early literacy and maths through a play-based approach as piloted through ELMI. Over the course of 2014 and early 2015, the ELMI project undertook several advocacy actions in order to influence the Rwandan pre-primary curriculum and its accompanying documents:

1. The ELMI programme manager consistently attended the workshops in which the new pre-primary curriculum was drafted.
2. Other Save the Children staff helped to carry through important ELMI elements into the draft learning and assessment standards for pre-primary and the specifications for pre-primary teaching and learning materials.
3. Save the Children contributed time from a technical specialist/consultant in ECCD issues to comment on the draft curriculum, propose contents for the teachers' guides, review the draft learning and assessment standards, and finally input on the specifications for pre-primary teaching and learning materials.

Overall, by reviewing the published and current draft documents⁹, it is clear that ELM principles have been incorporated into each of the relevant parts of the pre-primary curriculum as mentioned above. The curriculum and standards documents both address the five early literacy knowledge areas and the

⁹ Note that this review was undertaken internally by Save the Children; however, the new curriculum is publicly available for confirmation of these conclusions at the following site:
http://reb.rw/fileadmin/competence_based_curriculum/pre_primary_syllabuse.html

five early maths knowledge areas. While the teachers' guide and the materials specification documents are still under development, Save the Children's inputs to them were highly appreciated by the Rwanda Education Board and are likely to be incorporated. The knowledgeable contributions made by the Save the Children consultant were recognized by REB leadership in relevant Technical Working Group meetings, and this has provided opportunities for continued engagement in the many different issues related to the core curriculum development process.

To be even more precise about the ELMI contribution, it is useful to compare the new curriculum to that which was developed for ECCD in 2006/2007 with the support of UNICEF. This earlier curriculum emphasized all five early maths knowledge areas and at least three of the five early literacy knowledge areas: oral language development, print awareness, and book awareness received significant attention, but there was less focus on alphabetic awareness and on phonemic & phonological awareness. In general, however, this earlier curriculum effort was also of high quality, incorporating international best-practices in play-based early childhood education. In light of this comparison, we could say that the ELMI advocacy achievement truly resided in ensuring that this earlier high standard of quality was carried through into the new pre-primary curriculum. Since the new curriculum was developed by a new set of participants, most of whom did not have such strong specialist knowledge of early childhood education methods, this is a significant achievement.

Ultimately, an excellent curriculum matters only if teachers know how to put it into practice. For this reason, the Save the Children-Rwanda office is also currently contributing staff members to the process of developing a new curriculum for pre-primary teacher candidates in Rwanda's Teacher Training Colleges.

Expected outcomes of the ELMI project

Reflecting on proposed targets, endline results display that substantial progress has been made on emergent literacy for both ELMI groups.

Gains for fine and gross motor development were reaching mastery at midline so they were not included in the endline assessment. On average, gains made by the ELMI Centre group did not reach the 35 percent growth target that was set at baseline, but the ELMI Parenting group did meet the 20 percent growth target for children's school readiness score gains and parenting practices with respect to learning activities, as reported at midline¹⁰.

Grade 1 scores likewise did not meet the 20% higher score target set at baseline as scores were generally much lower than expected across all groups. See the figure below for the presentation of results against each indicator.

¹⁰ Note that some indicators relating to the first expected outcome - *Improved early learning environment and teachers' pedagogical practices supporting ELM skills* – and the second expected outcome - *Improved parenting practices in supporting ELM skills* - were presented in the Midline report. Data was not collected at endline in relation to these indicators as noted earlier in this report; however, the extract from the midline report on these findings is included in this report in Annex II and Annex IV.

Table 9. Intervention indicators

Indicators	Baseline Scores (% Correct)	Targets	Midline/Endline Scores ¹¹ (% Correct)
ECCD children’s scores in school readiness assessment (disaggregated by gender and foundational skills domains).	<ul style="list-style-type: none"> Gross motor: 86% Fine motor: 53% Literacy: 28% Numeracy: 33% Socio-emotional: 37% Health: 50% Overall School Readiness Assessment: 48% 	35% increase on baseline. ¹²	<ul style="list-style-type: none"> Gross motor: 96% Fine motor: 71% Literacy: 56% Numeracy: 51% Socio-emotional: 50% Health: 63% Overall School Readiness Assessment: 64%
Non-ECCD children’s scores in school readiness assessment, whose parents are being trained by the ELM initiative (disaggregated by gender and foundational skills domains).	<ul style="list-style-type: none"> Gross motor: 84% Fine motor: 40% Literacy: 22% Numeracy: 27% Socio-emotional: 32% Health: 46% Overall SRA: 42% 	20% increase on baseline.	<ul style="list-style-type: none"> Gross motor: 93% Fine motor: 61% Literacy: 44% Numeracy: 44% Socio-emotional: 42% Health: 59% Overall SRA: 57%
Parents/caregivers’ scores in home environment assessment (disaggregated by gender).	<ul style="list-style-type: none"> Learning activities: 9% Play-based activities: 36% 	20% increase on baseline.	<ul style="list-style-type: none"> Learning activities: 34% Play-based activities: 50%
ECCD teachers’ scores in classroom environment assessment (disaggregated by gender).	<ul style="list-style-type: none"> Literacy environment (ECERS): 28% Maths environment (ECERS): 46% 	25% increase on baseline.	<ul style="list-style-type: none"> Literacy environment (ECERS): 54% Maths environment (ECERS): 59%

¹¹ Note that no significant differences based on gender were found for any group and foundational skill domain; as such, these have not been specifically indicated as disaggregated figures.

¹² It should be noted that the general target of 35% growth from baseline to endline for children’s school readiness scores is not applicable for gross motor skills as on average children scored 86% correct on these items at baseline.

<p>G1 children’s scores in literacy and maths skills¹³</p>	<p>Non-ECCD Control</p> <ul style="list-style-type: none"> • Literacy: 16% • Numeracy: 16% • Socio-emotional: 26% • Overall SRA: 20% <p>ELMI Centre</p> <ul style="list-style-type: none"> • Literacy: 19% • Numeracy: 17% • Socio-emotional: 26% • Overall SRA: 21% <p>ELMI Parenting</p> <ul style="list-style-type: none"> • Literacy: 15% • Numeracy: 12% • Socio-emotional: 23% • Overall SRA: 17% 	<p>20% higher scores amongst children exposed to ELMI than those of the ‘non-ECCD’ control children</p>	<p>Non-ECCD control</p> <ul style="list-style-type: none"> • Literacy: 30% • Numeracy: 25% • Socio-emotional: 39% • Overall SRA: 32% <p>ELMI Centre</p> <ul style="list-style-type: none"> • Literacy: 44% • Numeracy: 37% • Socio-emotional: 53% • Overall SRA: 44% <p>ELMI Parenting</p> <ul style="list-style-type: none"> • Literacy: 42% • Numeracy: 35% • Socio-emotional: 52% • Overall SRA: 43%
<p>Evidence of inclusion of ELM in GoR’s revised ECCD curriculum</p>	<p>N/A</p>	<p>ECCD curriculum includes ELM.</p>	<p>New pre-primary curriculum and associated documents include the ELMI play-based approach and ELM concentrations.</p>

Limitations

This study has limitations that should be noted before drawing conclusions from the data. Most notably, due to practical constraints and attrition the sample size in the study is smaller than would be optimal and reduces the power in statistical analyses. Therefore, the significance of differences between groups or between predictor and outcome variables may be underestimated. In addition, due to children’s developing capabilities different assessment items were used at different stages of the study so only a subset are available for comparison across all three time points.

Conclusions and Policy Implications

This endline report sought to answer the following research questions:

1. What skills have children in each of the groups gained in terms of literacy, mathematics, and socio-emotional development since their entry into grade 1?
2. What factors, including the quality of primary learning environments, are correlated with the children’s gains on the school readiness assessment at endline?
3. Overall, did the ELMI intervention meet the expected outcomes of the project?

This evaluation found positive results with respect to gains in areas of ELMI intervention as compared to control groups. Particularly salient were the gains made by the ELM Parenting children in relation to all other groups. However, not all targets established at the start of the project were met, as generally the

¹³ This indicator measured only at endline. Baseline and endline score shown reflect only items used in both assessment with children who were present at both points in time.

level of school readiness skills across all groups remained quite low compared to experiences in other Save the Children ELMI implementation countries, which informed the setting of target expectations.

In addition to highlighting the progress of ELMI against targets, the endline results also revealed the following salient findings:

Looking at the literacy and maths outcomes of children at endline, data shows a concerning overall trend, mainly that gains between midline and endline are very modest, with less than half the gains we documented between baseline and midline. This finding should be read in relation to the implementation timeframe: ELMI Children were only exposed to the ELMI intervention between the baseline and midline period – midline occurred in September, and the school year finished in October; these children entered Grade 1 in January 2015 and therefore were no longer exposed to ELMI but rather entered into the regular school system. However, despite being in the second term of grade 1, literacy and maths scores across the groups are barely reaching 50%, confirming the fact that **even in grade 1, children are still working on gaining what are considered foundational preschool skills and are not ready for more complex or sophisticated learning.** Certainly this has strong implications for future programming in both preschool and grade 1. Either grade 1 curriculum and instruction is not suitably aligned with children’s skills and competencies or factors such as large class sizes, different ECD backgrounds and home experiences are contributing to the overall stagnant trajectories of learning.

Despite the generally low trends, **children in the ELMI Centre and ELMI Parenting groups showed statistically significantly higher scores at endline on both literacy and maths compared to children in the Non-ECCD control group.** ELMI parenting children started off lowest across all groups on all domains at baseline and over time caught up almost entirely with their ELMI ECCD peers, closing the gap from baseline. In fact the ELMI Parenting group continued to gain skills between midline and endline at a higher rate than the rest of the groups, which is extremely positive as this points to the continued value that parenting support can bring to children’s ELM skills development. Gains made by children in the ELMI Centre and ELMI Parenting groups are not significantly different from one another at endline.

This very promising finding has strong implications for future programming. **The ELM Parenting component was much less resource intensive yet seems to have produced almost the same gains as the ELMI ECD centre program, suggesting that as the government attempts to scale up ECCD provision nationally in the years to come, the ELM parent outreach model should be considered seriously as an alternative to the more traditional approach.** ELMI Parenting may be especially relevant for hard to reach populations or alternately for areas with more children than an ECD classroom can accommodate.

Furthermore, when we look at background characteristics, we see that **not only do the ELMI Centre and Parenting programs produce strong learning gains on average, but these interventions are benefitting all families and children equally, regardless of socioeconomic status,** which contrasts with the findings from the ECCD Control group.

On the other side, when we look at the non-ECCD control group, we note that these children generally had more or less the same starting point as the ELMI ECCD group at baseline, yet over time we see them falling further and further behind. The data from this study showed that the gap between these children

and their ECCD counterparts is widening as children enter the formal school system. **This clear downward trajectory of learning for children without any ECCD background also has strong policy implications and confirms the value and benefits of any ECCD experience in the preschool years over none.** As the government is looking for ways to make ECCD provision more widely available, again a combination of approaches and models might best meet the growing need and close the gap between children with and without ECCD that are likely to widen even more in grade 2 and beyond.

Across the groups, the repetition rate in grade 1 of children who entered primary school a year early is truly alarming. On average 70% of early entrants repeated Grade 1, suggesting rates of repetition that are distressingly high, particularly compared to an already high national average of 18.3% primary repetition rate¹⁴ in 2013. The cost of grade repetition is high, especially when the rates are so dramatic. Qualitative data collected at midline seeking clarification to the high early enrolment rates revealed that the cost of ECCD was a driving factor for parents to enroll their children early in P1, as primary school is free whereas ECCD services require parental contributions. **There are clear benefits to staying in ECCD and not enrolling kids in P1 early and the government should seriously consider investing into fee-free quality ECCD programs as a long-term strategy to reduce repetition and improve primary school outcomes.** It is clear that the grade 1 experience of many children, especially those who enter early, is not marked by success and in fact might be spinning children into a negative downward trajectory. The findings of this study demonstrate the little learning on foundational literacy and maths is happening in the first half of grade 1, which brings up the need to review and reflect on the grade 1 curriculum in light of the school readiness skills children bring to school. A bridging curriculum might be needed at least for the first half of Grade 1 to ensure children gain all foundational skills needed to ensure they are ready for the expectations and competencies in grade 1. As it is, even basic skills such as oral vocabulary and one to one correspondence are trailing behind.

Data collected from classroom observations in Grade 1 also reiterate the need for further and serious attention to Grade 1 classroom learning environments and the transitions of children between preschool and primary school. Classrooms generally appeared under-resourced with class sizes of 50+ children, higher than what would be considered optimal for learning. Further, less than 30% of students had textbooks to follow in class and even fewer brought homework and textbooks back home. **The strongest relationship seen between school environment and child learning was the number of textbooks found in a classroom, which is positively related to learning gains in literacy and numeracy.** This trend was found across all the groups, demonstrating the value of having a textbook in class for gaining literacy and maths skills.

Interestingly, we re-confirmed that ECCD centre quality matters even for endline scores. This suggests that **children who attended high quality ECCD centres were not only better prepared for Grade 1, but also retained their advantage into Grade 1 and had double the gains of their peers who attended low quality ECCD centres.** Future studies should explore further this important finding for the long term value of high quality ECD centres.

¹⁴ According to the 2014 National Education Statistics as reported by MINEDUC at the Joint Review of the Education Sector, June 2015.

As the Government of Rwanda continues to strive towards ESSP and EDPRS2 goals of higher access to ECCD and pre-primary services for children, as well as improved quality learning outcomes for children in primary school, these findings should be taken into important consideration. Notably, the quality of preschool services provided should be given particular attention to try and ensure that the maximum gains possible can be obtained for children before entering primary school. Additionally, alternative approaches, such as the ELMI Parenting model, should be considered as a low cost and effective means of supporting children's school readiness skills development. In particular, the comparatively larger continued gains observed in ELMI Parenting children from midline to endline point to this model as one that will help children to retain and build on their early literacy and maths skills as parents continue to engage with their children upon transition to primary school. Furthermore, given alarmingly high repetition rates of children entering P1 early, and the related costs in terms of financial expenditure on service provision for repeating children, quality learning implications for all students due to larger class sizes, and the implications for children's socio-emotional wellbeing when having to repeat a grade, it is highly recommended that further studies be conducted to assess the longer-term benefits vis-à-vis cost implications of offering fee-free ECCD or pre-primary services. Likewise, these findings should inform efforts already being undertaken by the Government of Rwanda to improve the quality of learning in Grade 1.

Appendix A.

Table A1. Equity analysis of baseline-endline learning gains: ELMI Centre

VARIABLES	(1) Numeracy Endline	(2) Literacy Endline	(3) Socio- emotional Endline	(4) Total SRA Endline
Child age	0.00263 (0.00922)	-0.00531 (0.00904)	-0.0398 (0.0126)	-0.0246 (0.0118)
Child is female	-0.00848 (0.0174)	-0.0363 (0.0175)	0.0184 (0.0225)	-0.0369 (0.0197)
Mother education	0.0617 (0.0167)	0.0652 (0.0126)	0.0697 (0.0158)	0.0730 (0.0170)
SES (baseline)	-0.00114 (0.00752)	-0.00674 (0.00951)	-0.00480 (0.0106)	-0.00470 (0.00996)
HLE (baseline)	-0.00667 (0.00778)	-0.0291 (0.0109)	-0.0278 (0.0108)	-0.0219 (0.00903)
# types of reading materials at home (baseline)	0.0210 (0.00856)	-0.00436 (0.00497)	0.000791 (0.00529)	-0.00132 (0.00598)
Numeracy baseline	0.723 (0.157)			
Literacy baseline		0.653* (0.0213)		
Socio-emotional baseline			0.262* (0.0178)	
Total SRA baseline				0.579* (0.0445)
Constant	0.141 (0.0268)	0.391* (0.0180)	0.625** (0.00950)	0.425* (0.00802)
Observations	40	40	39	38
R-squared	0.167	0.178	0.157	0.182
Adjusted R-squared	-0.0150	-0.00185	-0.0336	-0.00873

Robust standard errors in parentheses

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

Table A2. Equity analysis of baseline-endline learning gains: ELMI Parenting

	(1) Numeracy Endline	(2) Literacy Endline	(3) Socio-emotional Endline	(4) Total SRA Endline
Child age	0.0285 (0.0254)	-0.0187 (0.0156)	-0.00228 (0.0275)	-0.00126 (0.00653)
Child is female	0.0422 (0.0210)	0.0556 (0.0287)	0.0273 (0.0110)	0.0341 (0.0249)
Mother education	0.0427* (0.00813)	0.0544 (0.0177)	0.0416 (0.0295)	0.0447 (0.0183)
SES (baseline)	-0.0109 (0.00666)	-0.00278 (0.00754)	-0.0129 (0.00787)	-0.00732 (0.00819)
HLE (baseline)	0.0152 (0.00763)	0.00474 (0.0125)	-0.00881 (0.0114)	0.00136 (0.0117)
# types of reading materials at home (baseline)	0.0499* (0.0111)	0.0447 (0.0199)	0.0444** (0.00267)	0.0429* (0.00673)
Numeracy baseline	1.060** (0.0969)			
Literacy baseline		0.612** (0.0419)		
Socio-emotional baseline			0.482** (0.0193)	
Total SRA baseline				0.826*** (0.0135)
Constant	-0.00480 (0.167)	0.285 (0.0978)	0.397 (0.106)	0.221 (0.0540)
Observations	138	139	132	128
R-squared	0.219	0.169	0.137	0.207
Adjusted R-squared	0.177	0.125	0.0884	0.161

Robust standard errors in parentheses

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

Table A3. Equity analysis of baseline-endline learning gains: ECCD Centre comparison

	(1) Numeracy Endline	(2) Literacy Endline	(3) Socio-emotional Endline	(4) Total SRA Endline
Child age	0.0552* (0.0108)	0.0459* (0.00885)	0.0720* (0.0138)	0.0574* (0.00594)
Child is female	-0.0917* (0.0176)	-0.0858* (0.00865)	-0.110** (0.00581)	-0.0905** (0.00545)
Mother education	0.0274 (0.0124)	0.0412* (0.00867)	0.0369 (0.0123)	0.0410* (0.00898)
SES (baseline)	0.0318* (0.00457)	0.0288** (0.00241)	0.0325** (0.00108)	0.0268** (0.00178)
HLE (baseline)	0.00167 (0.0282)	0.0339 (0.0223)	0.0286 (0.0104)	0.0194 (0.0217)
# types of reading materials at home (baseline)	-0.00925 (0.0190)	-0.0296 (0.0164)	-0.0343* (0.00769)	-0.0243 (0.0157)
Numeracy baseline	0.751* (0.124)			
Literacy baseline		0.297 (0.138)		
Socio-emotional baseline			-0.0496 (0.0619)	
Total SRA baseline				0.301* (0.0596)
Constant	-0.161 (0.0590)	-0.0890 (0.0544)	-0.0202 (0.0367)	-0.0973 (0.0518)
Observations	59	58	56	55
R-squared	0.278	0.282	0.189	0.259
r2_a	0.178	0.181	0.0708	0.149

Robust standard errors in parentheses

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

Table A4. Equity analysis of baseline-endline learning gains: Non-ECCD comparison

	(1) Numeracy Endline	(2) Literacy Endline	(3) Socio-emotional Endline	(4) Total SRA Endline
Child age	0.0501 (0.0330)	0.0696 (0.0440)	0.115** (0.0214)	0.0843 (0.0406)
Child is female	0.0671 (0.0282)	0.0318 (0.0433)	0.0552 (0.0352)	0.0693 (0.0287)
Mother education	0.0188 (0.0148)	0.0287 (0.0264)	0.0119 (0.00961)	0.0129 (0.00840)
SES (baseline)	0.0353* (0.0124)	0.0295 (0.0185)	0.0464* (0.0165)	0.0426** (0.00692)
HLE (baseline)	-0.0116 (0.00700)	0.000708 (0.0112)	0.0190 (0.00964)	0.0105 (0.00864)
# types of reading materials at home (baseline)	0.0141 (0.0308)	-0.0363 (0.0532)	-0.0922** (0.0128)	-0.0531 (0.0251)
Numeracy baseline	0.113 (0.270)			
Literacy baseline		0.289 (0.378)		
Socio-emotional baseline			0.523* (0.183)	
Total SRA baseline				0.481 (0.182)
Constant	-0.160 (0.247)	-0.216 (0.269)	-0.518* (0.146)	-0.384 (0.224)
Observations	50	50	45	43
R-squared	0.224	0.102	0.207	0.184
r2_a	0.0943	-0.0479	0.0564	0.0212

Robust standard errors in parentheses

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

Table A5. Midline ECERS score predicting midline-endline learning gains: ELMI Centre

VARIABLES	(1) Socio- emotional Endline	(2) Literacy Endline	(3) Numeracy Endline	(4) Total SRA Endline
Total ECERS (midline)	0.0202 (0.0256)	0.0762** (0.0276)	0.0519 (0.0383)	0.0448* (0.0221)
Socio-emotional (midline)	0.424*** (0.0954)			
Literacy (midline)		0.640*** (0.112)		
Numeracy (midline)			0.595*** (0.1000)	
Total SRA (midline)				0.769*** (0.0932)
Constant	0.333*** (0.0870)	-0.000197 (0.0949)	0.106 (0.135)	0.0706 (0.0709)
Observations	95	102	99	92
Number of schools	38	38	38	38
r^2_a

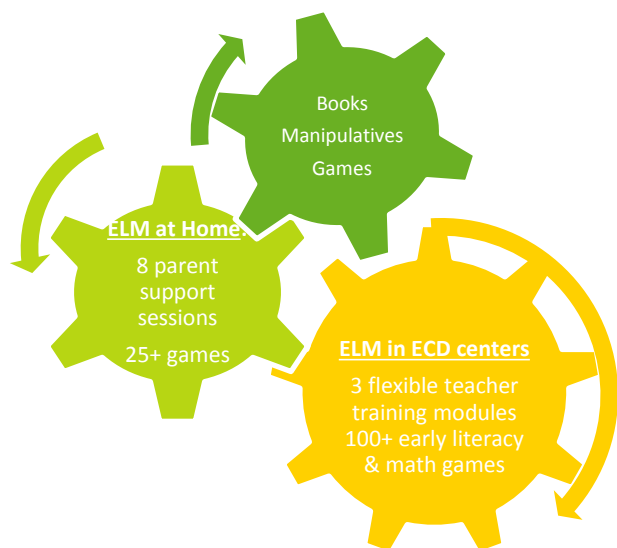
Robust standard errors in parentheses

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

Annex I - Brief summary of ELMI program

Research on literacy development suggests that the foundations of learning to read and write are set long before a child enters first grade. The process of becoming literate is intertwined with the development of emergent literacy skills and the experiences children have with language and print during early childhood years (Mullis, Martin, Kennedy, & Foy, 2007). Similarly, even before children learn to add, subtract, multiply or divide, they learn concepts about numbers that are part of emergent maths and that pave the way to more complex maths competencies and proficiency in early primary grades and beyond.

Save the Children believes that these foundational skills can be supported meaningfully during the early childhood years both in the home as well as in ECCD centres. Through a rigorous ELM toolkit developed by Save the Children US, the overarching objective of the Early Literacy and Maths Initiative is to develop an evidence-based, scalable programme that effectively supports ELM skills of ECCD age children (3-6 years) in Rwanda.



The toolkit has three key components:

- 1) A training package for early childhood teachers/facilitators (*ELM in ECCD Centres*) focused on playful and age-appropriate ways to support ELM skills in the classroom.
- 2) A family outreach package (*ELM at Home*) extending opportunities to develop ELM skills at home, especially for those children with no access to ECCD centres.
- 3) Age-appropriate books available to children both at home and in ECCD centres, as well as hands-on maths manipulatives and games.

The project aimed to achieve the following outcomes, measured by the indicators in the table:

Outcome	Indicators
Improved early learning environment and teachers' pedagogical practices supporting ELM skills	ECD children's scores in school readiness assessment (disaggregated by gender and foundational skills domains)
	Non-ECD children's scores in school readiness assessment, whose parents are being trained by the ELM initiative (disaggregated by gender and foundational skills domains).
	ECD teachers' scores in classroom environment assessment (disaggregated by gender).
	G1 children's scores in literacy and maths skills
Improved parenting practices in supporting ELM skills	Parents/caregivers' scores in home environment assessment (disaggregated by gender).
ELM approach included in revised GoR's ECD curriculum	Evidence of inclusion of ELM in GoR's revised ECD curriculum

Through the implementation of ELMI project, this was tackled by:

- 1) Training ECCD caregivers in 21 existing ECCD centres to effectively support ELM skills development among children;
- 2) Providing ongoing monitoring and coaching to ECCD caregivers /teachers to improve the way ELM is delivered to children in classrooms;
- 3) Training parents to actively support children's ELM skills development at home;
- 4) Providing ongoing monitoring and coaching to Parents' Facilitators to improve the way they deliver parenting sessions;
- 5) Providing age appropriate books for both centre-based and home-based groups to support early reading skills among children;
- 6) Engaging in advocacy to build leadership and commitment to the ELMI approach within the Government of Rwanda.

Annex II – Conclusions from the midline report

Reflecting on our proposed targets, midline results display that substantial progress has been made on all indicators for ELMI groups. Goals set at baseline were already realized for children in the ELMI Parenting groups for Emergent Literacy skills, as well as increases in learning-focused behaviors by parents.

Children in intervention groups display mastery of gross motor skills, and are approaching mastery of fine motor items. While strong progress is made in Emergent Literacy and Numeracy, average scores still hover around 50 percent correct at midline, shortly before children are expected to transition to primary school. These scores are lower than anticipated, on average, especially for the more intensive ELMI centre intervention group, however clearly moderated by quality of the ECCD centres and children attending high quality ECD centres were on par with the projected gains. There are a number of reasons why that is the case that are worth noting here.

On one hand, what the findings suggest is that more work is needed to improve overall quality of ECCD centres and ensure conditions are in place for children to benefit from the stronger focus on ELM. This is especially true in the context of classrooms with over 50 children per teacher, which was the case for most of the ECD centres under ELMI. It is very hard to achieve desired results even with the most effective teacher training methodology if teacher to student ratio is as high. As such, at the start of the project teachers were struggling to employ ELM practices and reverted to whole class instruction only, which limited the impact of the ELM toolkit use during that first phase. These issues were partially overcome by ELMI staff working with parent committees to try and limit class sizes, which included a decision by the project to pay caregiver incentives to enable parent committees to rely less on having larger numbers of parent contributing to support running costs. Additionally, ELMI staff provided significant mentorship support to caregivers to help them learn how to manage large class sizes through the establishment of learning corners and modeling other interactive techniques.

Secondly, ELMI activities were slightly behind schedule and the training, supplementary materials and mentoring support only took full effect in the second year of ELMI¹⁵. Impact could be stronger in the future if children benefit from more than a year of ELM experiences, which is something worth considering in future programming. In addition to the late start up, the program faced challenges with ensuring consistent quality across the four districts. Rubavu specifically struggled because of a significant gap in technical oversight there for much of the first year; this is reflected in the ECERS scores in this particular district.

Finally, daily attendance of children in the program was not consistent over the course of the year, which also curtails the impact observed on children. While we did not analyze attendance rates as they relate to outcomes in this study, in other studies globally the trend is quite strong and exposure/attendance has a direct effect on children's learning.

¹⁵ This is particularly the case considering that the first training of Caregivers took place in August 2013, following the lengthy baseline and subsequent staff training process, and the school year finished in October.

Despite these challenges during the implementation of the ELMI, it is encouraging that we see some of the largest gains in the areas of literacy and maths among the ELMI children, and especially high gains among the children who attended high quality ECCD centres. Challenging skills such as phonological awareness and problem solving require further attention and support for teachers, but many of the foundational skills addressed by the ELMI toolkit are progressing well, as demonstrated in the following table showing progress against the project indicators:

Indicators	Baseline Scores (% Correct)	Targets	Midline Scores ¹⁶ (% Correct)
ECD children's scores in school readiness assessment (disaggregated by gender and foundational skills domains).	<ul style="list-style-type: none"> Gross motor: 86% Fine motor: 53% Literacy: 28% Numeracy: 33% Socio-emotional: 37% Health: 50% Overall SRA: 48% 	35% increase on baseline. ¹⁷	<ul style="list-style-type: none"> Gross motor: 96% Fine motor: 71% Literacy: 56% Numeracy: 51% Socio-emotional: 50% Health: 63% Overall SRA: 64%
Non-ECD children's scores in school readiness assessment, whose parents are being trained by the ELM initiative (disaggregated by gender and foundational skills domains).	<ul style="list-style-type: none"> Gross motor: 84% Fine motor: 40% Literacy: 22% Numeracy: 27% Socio-emotional: 32% Health: 46% Overall SRA: 42% 	20% increase on baseline.	<ul style="list-style-type: none"> Gross motor: 93% Fine motor: 61% Literacy: 44% Numeracy: 44% Socio-emotional: 42% Health: 59% Overall SRA: 57%
Parents/caregivers' scores in home environment assessment (disaggregated by gender).	<ul style="list-style-type: none"> Learning activities: 9% Play-based activities: 36% 	20% increase on baseline.	<ul style="list-style-type: none"> Learning activities: 34% Play-based activities: 50%
ECD teachers' scores in classroom environment assessment (disaggregated by gender).	<ul style="list-style-type: none"> Literacy environment (ECERS): 28% Math environment (ECERS): 46% 	25% increase on baseline.	<ul style="list-style-type: none"> Literacy environment (ECERS): 54% Math environment (ECERS): 59%
Evidence of inclusion of ELM in GoR's revised ECD curriculum	To be reviewed upon release of revised pre-primary curriculum (expected in 2015).	ECD curriculum includes ELM.	N/A

In addition to highlighting the progress of ELMI against targets, the midline results also revealed the following salient findings:

¹⁶ Note that no significant differences based on gender were found for any group and foundational skill domain; as such, these have not been specifically indicated as disaggregated figures.

¹⁷ It should be noted that the general target of 35% growth from baseline to endline for children's school readiness scores is not applicable for gross motor skills as on average children scored 86% correct on these items at baseline.

The scores of children in ELMI Parenting and ECCD Control centres are comparable from baseline to midline. On average the gains made by children in the parenting group were notable and on par with the gains of the children in the non-ELMI ECCD centres, and in some instances comparable to the gains of the ELMI ECCD group. When looking at the sub set of ELMI Parenting group participants who reported engaging in four or more positive activities with the child, results demonstrate that the ELMI ECCD group and this subset of ELMI parenting children make comparable gains over the course of the year. Taking into consideration the low cost and lower intensity of the ELMI parenting program, this is a very exciting finding as the program can be scaled up much more easily. **This emphasized that a high quality parenting education programme can serve as an effective alternative to more costly centre-based approaches to ECCD.**

Additionally, the amount of play activities at home at midline has the most consistent relationship with skill growth across groups. The study demonstrated that while the ELMI parenting group started with lowest rates of parent engagement at baseline, they improved the most in terms of learning and play activities at home, outscoring all other groups at midline. It seems that ELMI parenting families embraced the idea of play and learning at home and took their role seriously, which in turn paid off when we look at the child outcomes in this intervention group. **This demonstrates the importance of home environments and family engagement as a powerful driver of child achievement.**

Similarly, children's gains in literacy and maths skills are directly correlated to the quality of teaching and learning environments in Centres and homes. Improvements in children's learning environments are apparent in homes for the ELMI Parenting group and also ECCD classrooms for the ELMI Centre group. For children in the ELMI Parenting group, gains in parent-child interactions at home are notable between baseline and midline. In addition, the quality of ELMI ECCD Centres is also found to be improving over time. **Importantly, this study finds that parents' interactions with their children at home and quality of children's classroom environments are both positively related with children's early learning gains, further highlighting the need to support quality learning environments wherever they are.**

What is also interesting is the comparison between the grade 1 sample in this study (who had very limited ELM exposure but substantial grade 1 instruction) and the ELMI centre group. This study showed that **ELMI ECCD children come quite close in knowledge and skills on maths and literacy vis-a-vis their grade 1 counterparts.** With some exceptions, such as in the areas of letter and number knowledge, grade one students still scored quite low on the school readiness maths and literacy domains of the assessment, posing some critical questions about the quality of learning that has been taking place in first grade. At the end of grade 1, students knew on average 5 letters, compared to 2 letters in the ELMI ECCD group. In terms of maths, the ELMI scores were even closer to the scores of their grade 1 counterparts. It will be very interesting at endline to compare grade 1 competencies of ELMI graduates with the findings of this grade 1 cohort at midline.

Another notable result of this study is the lessons learned about children transitioning to primary school earlier than intended. Interestingly, children in ELMI ECCD Centres were the most likely to transition to primary school early and children in the ELMI Parenting group were the least likely. Future

studies could investigate retention in ECCD and whether different types of programs can help reduce the rate of children's early enrollment into primary school. In addition, further research could also investigate the longer-term impact of ECCD participation on primary school learning, as well as the costs associated with different types of programs and the relationship with learning gains.

In conclusion, children in three different types of early childhood care and development programs are found to be gaining more skills in a variety of learning and development areas than children who are not attending any type of early learning program. In general, children in the ELMI Centre group tend to come from relatively more advantaged families and maintain stronger early learning skills than children in other groups from baseline to midline. The differences in baseline skills and family backgrounds make it difficult to directly compare the ELMI Centre group with the ELMI Parenting and ECCD control groups. However, **children in the ELMI Parenting and ECCD control groups have more similar profiles and also make comparable learning gains from baseline to midline. This suggests that high quality parenting programs can be used effectively by relatively lower income families, and can help children who do not have access to ECCD centres become as prepared for entry to primary school as children who do have access to an ECCD centre. Finally, this study clearly demonstrates that quality of preschool classrooms is tightly linked to the gains children make in learning and development. Future expansion of preschool initiatives in Rwanda should pay close attention to issues of quality and invest in high quality environments to ensure the best results for children.**

Annex III. Qualitative feedback from ELMI stakeholders

With interest in the voices of stakeholders, additional insights on the project outcomes were gathered after getting some quantitative evidence that the project was effective. One of the four interviewees had her child benefiting from the ELMI intervention and she commended the project achievements: *“My child clever, clean, social, disciplined, he has developed in Maths and Literacy. He likes school and he is able to answer when you ask him a question. Really ELMI program has been helpful to him.”* (Parent, Burera district).

In addition to the overall success and impact of the project in equipping children with school readiness skills and early literacy and maths skills, even their performance and learning outcomes are higher after entering primary school, according to a teacher of the class attended by ELMI-children:

“It was at the beginning of this academic year that I received children who studied from Save the Children [parenting education]. These children really perform well, like last term a girl who was the first in the class had studied from Save the Children project. Others [from the same project] also came in the first positions.” (P1 Teacher, Ruhango District).

“They are responsible and organized compared to non-ELMI children. Non-ELMI children lack these skills. They are not ready for school. They need P1 teacher first to prepare them before teaching.” (Caregiver, Gicumbi District).

All voices converge as regards the challenges of teaching children without prior pre-primary education. It is clearly exemplified with tangible examples at hand that non-ELMI children miss the basic skills necessary to succeed socially and academically at school. It is time-consuming to bring such children on board compared to their peers who have completed ELMI.

“For example children I have here who did not go to any pre-primary, I have hard time to teach them the basics of discipline, they really don’t behave as those with pre-primary background. I start from zero teaching them the basics of counting, etc. ... They are really different ... Some do not know how to use toilets, they use bad language, etc. I really struggle hard with them, but life becomes easier with those with a pre-primary background.” (P1 Teacher, Ruhango District).

“ECCD children do not fear teachers, they are organised, clean, know how to handle a book and a pen. They can also go to the toilet by themselves. Non- ECCD children fear to hold pens and books, they can’t go to the toilet by themselves, lack hygiene and smartness. These challenges cost us extra time which was not planned in our teaching.” (P1 Teacher, Rubavu district)

Further qualitative evidence from a parenting facilitator, though her views do not necessarily reflect academic performance, implies the prerequisite skills to perform at school. What is portrayed here are two different groups of children, with ELMI children being better equipped than non-ELMI ones:

“Children who have gone through this program are more ready for school than their age mates who have not gone through the same program. For example children who have not gone through this program find it hard to make friends with ease, they are timid and sometimes they

cannot go to the toilet but they wet themselves. Children who haven't gone through this program can't hold well a pen or pencil.” (Parenting Facilitator, Burera district)

In addition to these positive reports, challenges have also been mentioned by the interviewees. Amongst these, they requested: *“Increase the number of Learning Materials delivered. When we receive a little number of lovely materials like cars and babies, children fight.”* (Caregiver, Gicumbi district). Additionally, as parents committees ask parents to pay incentives relating to ELMI ECCD Centres, they were met with some reluctance, resulting in limited access to preschool education for some children: *“Parent committees ask parents to pay incentives, and parents prefer to keep their children at home till school age.”* (Caregiver, Gicumbi district). Despite the challenges, the role of local authorities in preschool education was also mentioned; it was pointed out that with the involvement of local authorities, community mobilization to bring children for preschool education could be easier.

Annex IV: Midline Findings in Relation to Expected Outcome 2 – Improvements in Parenting Practices

In addition to comparing children’s early skills, caregivers were also surveyed about their activities at home with children. All parents, regardless of whether their child was enrolled in primary school, were surveyed again at midline so caregivers of all children assessed at baseline and midline will be included in this section. The increased sample size does allow for direct comparison of changes between groups.

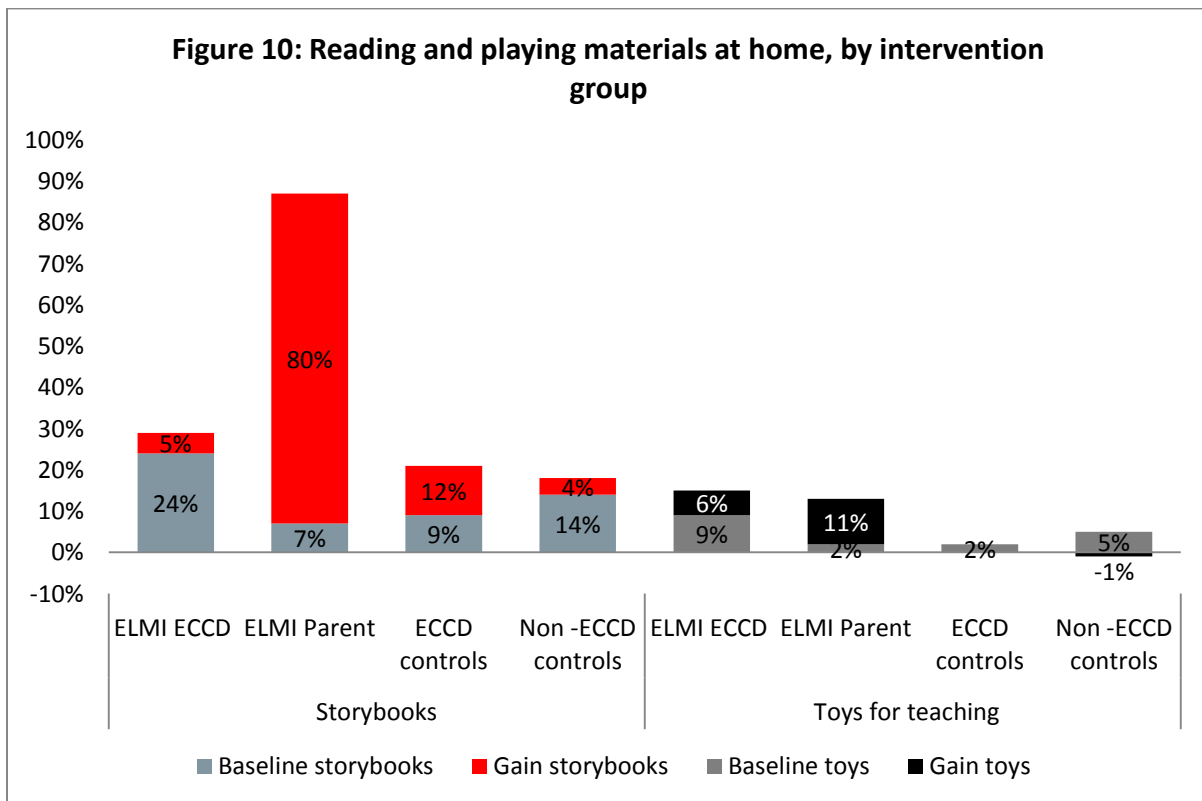
Materials at home

One key element of engaging children in learning and developmentally appropriate play at home is access to and knowledge about materials to help them do so. Often parents have multiple resources at home that can be used to help children learn, but they are not aware of these. Table 20 displays the reported prevalence of toys and reading materials in homes at baseline and midline. Overall, all parents report some gains in the amount of reading materials or toys at home. However, parents in the ELMI Parenting group report gaining more storybooks compared to parents in other groups, which is to be expected as each parent ‘graduating’ from the parenting sessions received 2 books and have access to community book banks provided by the project.

Table 20. Learning and playing materials at home, by intervention group

	ELMI (N=74)		Parenting (N=167)		ECCD control (N=68)		Non-ECCD control (N=82)	
	Baseline	Midline	Baseline	Midline	Baseline	Midline	Baseline	Midline
Storybook	24%	29%	7%	87%	9%	23%	14%	18%
Textbooks	21%	46%	6%	33%	6%	23%	6%	41%
Magazine	0%	15%	2%	6%	2%	11%	1%	11%
Newspaper	4%	5%	4%	18%	5%	5%	2%	5%
Religious book	61%	51%	43%	49%	47%	43%	35%	50%
Coloring book	11%	9%	3%	14%	5%	5%	2%	6%
Comics	5%	4%	2%	5%	5%	3%	2%	4%
Homemade toys	64%	88%	69%	95%	66%	88%	68%	94%
Manufactured toys	26%	28%	15%	19%	2%	30%	18%	13%
Household objects	55%	72%	80%	78%	34%	52%	45%	83%
Outdoor objects	84%	77%	91%	90%	73%	76%	86%	87%
Writing materials	37%	50%	14%	13%	13%	18%	11%	17%
Puzzle	23%	13%	17%	6%	2%	2%	15%	2%
Toys for teaching	9%	15%	2%	13%	2%	2%	5%	4%
# types of reading materials	1.0	1.3	0.6	1.2	0.7	0.9	0.5	1.1
# types of toys	3.0	3.4	2.8	3.1	1.9	2.6	2.5	3.0

The Figure 10 below clearly demonstrates the very high gains in children’s books for the ELMI parenting group going from the lowest % at baseline (7%) to the highest % at midline- at 80% of households reporting having storybooks for children, well above the rest of the groups. We also see the notable gains in the parenting group around toys available at the home for teaching children new things – again the parenting group starts at 2% at baseline and gained the most in terms of availability of toys, while the control groups didn’t demonstrate any gains.



Activities at home

In conjunction with reporting on learning materials, parents also reported on activities occurring at home with their children. On average, parents who received the parenting intervention reported significantly increasing engagement in learning activities (i.e., reading books, naming objects, and teaching new things, letters, numbers, shapes and writing)¹⁸ with their children at home than parents in other groups. In addition, parents in the ELMI Parenting group also reported increasing engagement in more play activities (i.e., telling stories, singing, taking outside, playing, and hugging) than parents in the ELMI and non-ECCD control groups.

¹⁸ Activities were grouped into the categories of learning or playing using principle component analysis.

Table 21. Learning and playing materials at home, by intervention group

	ELMI (N=74)		Parenting (N=167)		ECCD control (N=68)		Non-ECCD control (N=82)	
	Baseline	Midline	Baseline	Midline	Baseline	Midline	Baseline	Midline
Read books	23%	37%	8%	56%	12%	19%	17%	25%
Tell stories	35%	36%	22%	40%	10%	43%	29%	31%
Sing	55%	35%	33%	46%	27%	31%	54%	35%
Take outside	68%	51%	40%	50%	45%	67%	51%	61%
Play	46%	40%	20%	46%	19%	42%	42%	36%
Name objects	27%	28%	5%	39%	3%	10%	10%	20%
Teach new things	43%	31%	10%	43%	5%	18%	18%	32%
Teach alphabet	40%	42%	9%	47%	9%	28%	14%	24%
Teach numbers	52%	45%	18%	62%	18%	30%	30%	39%
Teach shapes	8%	15%	1%	15%	3%	5%	6%	7%
Teach writing	47%	46%	8%	38%	16%	21%	22%	21%
Hug	83%	75%	64%	66%	70%	54%	89%	55%
Spank	70%	45%	38%	65%	37%	65%	57%	51%
Hit	35%	31%	36%	53%	12%	29%	51%	46%
Yell	73%	45%	52%	65%	66%	53%	69%	52%
School activities	2.5	2.5	0.6	3.0	0.7	1.3	1.2	1.6
Play activities	2.9	2.4	1.8	2.5	1.7	2.4	2.6	2.2
Aggressive activities	1.8	1.2	1.3	1.8	1.1	1.5	1.8	1.5

Figure 11 below demonstrates that ELMI parenting group started with lowest rates of engagement at baseline but improved the most in terms of learning and play activities at home, outscoring all other groups at midline, which in some instances actually showed a downward trajectory of family engagement - as in the case of ELMI centre group and the non ECCD controls in terms of play activities. It seems that ELMI parenting families embraced the idea of play and learning at home and took their role seriously.

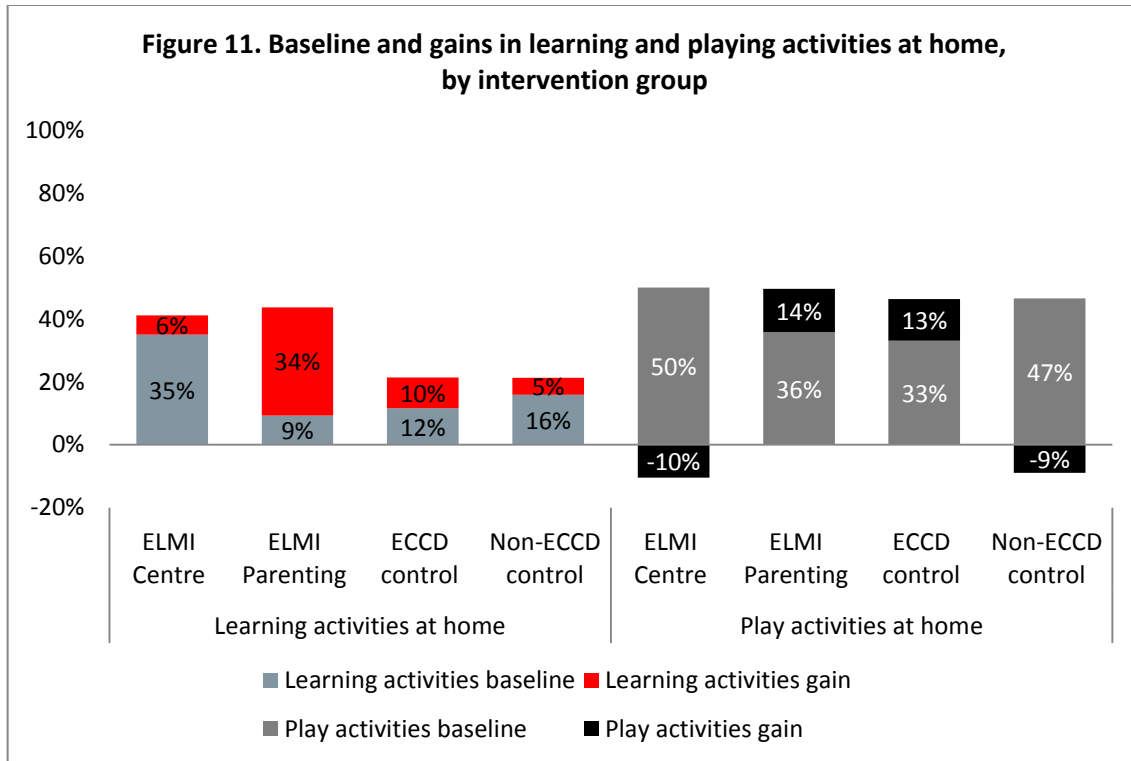
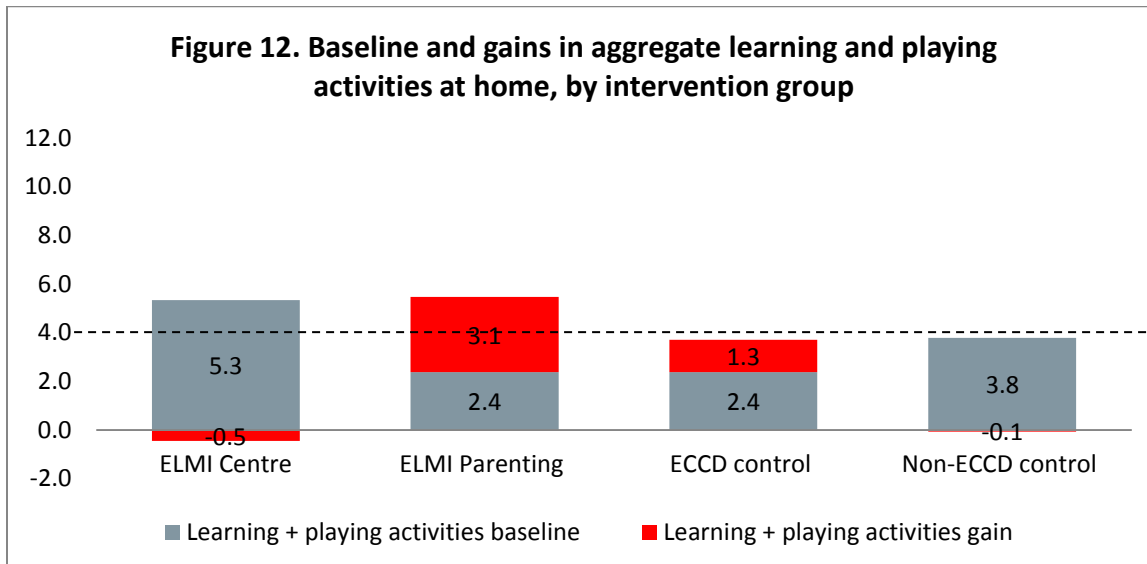


Figure 12 presents the aggregate gains across groups in home environment and activities. We see the same trends observed in the previous graph, with ELMI parenting group leading the way in providing stimulating activities at home.



Interestingly, when looking at gains made by children in the ELMI Centre group compared to children in the ELMI Parenting group whose parents' reported engaging in four or more positive activities with the child (a benchmark used by UNICEF's MICS survey to distinguish between a stimulating and non-

stimulating home environment), results show that ELMI Centre children have only a small advantage over ELMI Parenting children at baseline compared to the larger differences seen with the whole group (Figure 13). Further, results demonstrate that these two groups of children make comparable gains over the course of the year. **This suggests that strong parenting can have comparable impact to that of a high quality ECCD centre program.**

