Save the Children

EARLY LEARNING NATIONAL ASSESSMENT IN RWANDA

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RWANDA

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Abbreviations

Abbreviation	Full name
MINEDUC	Ministry of Education
REB	Rwanda Basic Education Board
ECD	Early Childhood Development
ECE	Early Childhood Education
IDELA	International Development and Early Learning Assessment
IDELA-CE	International Development and Early Learning Assessment – Classroom Environment
COVID-19	Coronavirus Disease 2019
P1	Grade 1 of primary school
PPE	Pre-primary education

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Executive summary

Over the past fifteen years, Rwanda has invested significant efforts into promoting access to basic education and holistic childhood development. Rwanda has achieved remarkable progress in expanding access to schooling with a net primary school enrolment rate of 99 percent. At the pre-primary school level, the Government of Rwanda began offering a one-year pre-primary education program in 2016 and enrollment was estimated at 20.8 per cent in 2018. Significant efforts have also been made to improve school curricula and educational institutions at the primary and pre-primary levels, but challenges remain, especially at the pre-primary level.

The COVID-19 pandemic brought a significant shock to the education system in Rwanda, and there is a lack of information on the status of children's learning in the early grades, as well as teaching and learning environments in schools and homes. This study contributes nationally representative data about children's school readiness skills, the quality of classroom environments, teacher motivation and wellbeing, home environments, and remote learning initiatives offered during COVID-19 school closure periods. This information can help practitioners and policymakers target their efforts to support students' learning in the post-COVID-19 period.

This study employed a quantitative method to assess children's learning and development using a nationally representative sample of students enrolled in public pre-primary (PPE) and grade 1 (P1) classes as of January-February 2021. This includes children entering P1 in 2021, and those from the 2020 P1 cohort who repeated the grade because they only received up to 2 months of P1 in 2020 due to COVID-19 related school closures. A sample of children enrolled in pre-primary classes in 2021 was included, using pre-primary class associated with sampled primary schools. Save the Children's pre-primary assessment tool, the International Early Childhood Development & Learning Assessment (IDELA) was used to assess school readiness skills among children, and the IDELA – Classroom Environment (CE) tool was used to measure PPE classroom quality. In addition, locally developed teacher and caregiver questionnaires were used to interview teachers and families of sampled students.

We find that, on average, children living in Kigali City demonstrate significantly more advanced skills than their peers in other Provinces in all domains, and across both grade levels. On average across Rwanda, 14.9 percent of children in PPE were reported to have accessed remote lessons during COVID-19 school closures, as well as 25.7 percent of Primary 1 students. Children living in Kigali City were most likely to access remote classes, and children in the Western Province were the least likely. Most children accessed remote lessons via radio (79 percent), followed by television (12 Click here to enter text.percent) and then mobile phones (4 percent). Children who accessed remote lessons demonstrated significantly stronger skills in motor development, literacy, numeracy, and overall school readiness compared to their peers who did not follow these lessons. The success of these remote classes, especially considering the speed with which they were developed and mobilized, suggests that they are an effective strategy to invest in to mitigate the effects of future education disruptions.

Considering the influence of COVID-19 on families of PPE and P1 children, caregivers report multiple changes to their livelihoods and wellbeing. On average, 68 percent of families report losing income due to COVID-19. In addition, 41 percent of caregivers report feeling nervous or stressed fairly or very often. Caregivers reported engaging in a number of different types of self-care activities to help cope with stress, most commonly praying. We did not find significant associations between these COVID-related caregiver factors and children's learning levels at the time of this study. However, we did find substantial relationships

between other home factors and children's learning and development. Specifically, children from wealthier households, and those with more learning materials (e.g., toys and books) and more home learning activities (e.g., reading, storytelling, playing) demonstrated significantly stronger learning and development skills than their peers with fewer of these resources at home. In addition, children who experienced more negative discipline at home demonstrated significantly weaker skills in motor development, literacy and the total IDELA score. These relationships found with learning, alongside the relatively lower levels of responsive caregiving in the home and higher harsh discipline practices, suggest that more support is needed for parents and caregivers of early grade children.

Teachers reported a range of changes to their attitudes toward teaching and classroom practices related to COVID-19. When asked if COVID-19 has changed how they relate to students, PPE and P1 teachers commonly reported feeling more stressed and having a higher temper. Despite reporting elevated levels of stress, teachers also typically reported feeling motivated and adequately prepared to teach after the lockdowns had ended. PPE and P1 teachers most commonly answered that they felt more motivated now to teach than prior to COVID-19. There was a significant correlation between teachers who reported being motivated by their interactions with students and children's skills at the P1 level. Considering how to continue to support and foster intrinsic motivation in teachers is warranted.

Results from the IDELA-CE observations find that, on average, classrooms have acceptable levels of classroom and health resources. Ratings of literacy and numeracy teaching practices and overall interactions in the classroom were also rated as sufficient. The highest rating was of interactions in the classroom - between teachers and children as well as between children. On average, PPE classrooms in Kigali City were found to be higher quality than classrooms in the North, South and Western Provinces (no difference with Eastern Province). Higher quality classrooms were associated with the presence of more experienced teachers, the longer length of support from a non-governmental organization (Save the Children in this case), and the presence of a nutrition program at the school. This suggests that classrooms and schools that have been receiving ongoing support from outside groups like NGOs, CSOs, or governmental partners in other sectors tend to have higher quality learning environments.

Finally, higher quality classrooms were associated with stronger learning and development skills for children. Resources and teaching related to literacy and numeracy, as well as interactions between teachers and children were most highly correlated with children's skills. Classrooms rated as having poor quality were associated with particularly low student learning scores. Focusing on supporting schools with the lowest quality classrooms to raise their service provision to a sufficient level could have substantial effects on advancing student learning and wellbeing.

I. Introduction

Over the past fifteen years, Rwanda has invested significant efforts into promoting access to basic education and holistic childhood development. All children, boys and girls, with or without disabilities, have a right to consistent and quality education. To deliver on this right, the Government of Rwanda has championed an enabling policy environment to promote holistic early childhood development. Significant investments have resulted in the development of an official pre-primary curriculum (2016), Pre-primary Teachers' guide (2016), Pre-primary Scheme of work (2018), Early Childhood Development Policy (2016), and the Minimum Standards and Norms for Early Childhood Development Services in Rwanda (2016). Expanding access and quality of pre-primary education is a priority in the Education Sector Strategic Plan, as well as MINEDUC's strategy to strengthen human capital. Despite this progress, significant challenges remain at the pre-primary school level including the quality of learning and teaching.

With all these frameworks, Rwanda has achieved remarkable progress in expanding access to schooling: The net enrolment rate, at the primary school level, stands at 99% (98.6% for girls and 98.4% for boys) and significant efforts have been made to improve school curricula and educational institutions.[1] At the pre-primary school level, the Government of Rwanda, through the Rwanda Basic Education Board (REB), started rolling out a one-year pre-primary school program using a competency-based curriculum in February 2016. The enrolment in pre-primary school has continually increased from 130,403 children in 2012 to 185,666 children in 2016. Yet, the majority of these children attending pre-primary school are enrolled in a private school with 89,225 (48%), followed by government-aided schools with 62,106 (33.5%) and then public with 34,335 (18.5%). The budget allocated to pre-primary school has increased from 3.7 billion for 2016/2017 budget to 4.0 billion for 2017/2018 counting an increase of 6.2%.

It was estimated that only 20.8% of preschool age children in Rwanda were enrolled in pre-primary education in 2018, compared to the 98.3% net-enrolment in primary school. This has slightly increased to 25.9% net pre-primary enrolment rate in 2020/21. Some of the identified reasons for this low enrolment in pre-primary are linked to the accessibility and quality of public pre-primary schools. Most public schools in Rwanda have only allocated one classroom for pre-primary which is not enough to meet the current demand and numbers of pre-primary age children eligible to enroll. In addition, most teachers in public pre-primary schools are not formally trained to teach young children and most are not on the government payroll, which hugely affects the quality of education in these schools. This poor quality of education in pre-primary schools in Rwanda is related to issues, including:

- Untrained and unqualified pre-primary teachers in Early Childhood Education/Pre-primary classrooms
- Inadequate numbers of pre-primary teachers on the government payroll in comparison to other levels of basic education. This means that the pre-primary teachers are either paid by contributions from parents or work as volunteers. With this description of volunteerism, anecdotal evidence and qualitative feedback from school leaders reveal high instances of teacher turnover.

[1] National Institute of Statistics of Rwanda (2020). 2020 Statistical Year Book. Kigali. NISR.

- Large class-size which has a huge impact on quality, estimated at a ratio of 1:60 compared to 2017/18 ESSP target of 1:40[2]
- Limited school feeding programs for children in ECD services.
- Limited number of high-quality age appropriate and child friendly teaching and learning materials
- Limited support from caregivers to send children to school with adequate materials or to provide early learning support at home

With the emerging COVID-19 pandemic worldwide, similar to other countries, Rwanda had to close pre-primary and primary schools from March – November 2020 in order to curb the spread of the pandemic and protect the students and teachers. During this time, children and their families struggled with numerous health, economic, and education challenges. Some children were able to access remote learning opportunities through government and NGO-supported programs, but others were not. It is not clear the extent to which children grew, maintained or lost foundational learning skills during their time out of school.

Due to the extended school closure in 2020, the MINEDUC in Rwanda decided that all primary school children would repeat the grade they enrolled in for 2020. Therefore, in 2021 there was a double cohort of children in P1 beginning in 2021 consisting of children who enrolled in 2020 and were disrupted by COVID-19, and those who are newly enrolling in 2021. Although MINEDUC constructed 22,505 new classrooms and recruited new teachers ahead of the school re-opening, these additional students brought considerable burden to schools and classrooms throughout the country.[3]

Prior to the COVID-19 pandemic, there was a lack of nationally representative data on quality of the classroom environment, home environment and school readiness skills of children in pre-primary as most of the attention was given to early grade reading. Having credible data on the status of children's learning, development and school readiness became even more urgent in the post COVID19 school closures discourse in Rwanda. This study contributes information about the status of Early Childhood Education in Rwanda. In addition, it contributes to an understanding of the quality of Early Childhood Education /Pre-primary classroom environments in the country, which has also been missing.

In late 2020, Save the Children in Rwanda was awarded funding through its Global Central Fund to adapt its education programming in response to the COVID-19 pandemic. In part, this funding was planned to be used to conduct a nationally representative, gender-sensitive study using the International Development and Early Learning Assessment (IDELA), to generate learning and evidence around early childhood education post long-term school closures to guide decision making at different levels of the education system,

There is also a gap in research about the extent to which the teaching methodology and aspects of environment/quality measures are contributing as intended to improve school readiness; this study has

[2] 2017/18 -2023/24 Education Sector Strategic Plan (ESSP), Ministry of Education,Rwanda https://www.mineduc.gov.rw/index.php?eID=dumpFile&t=f&f=9790&token=13d933d024ecf9fc044a2e163b8c3b0c46a45d33

[3] 2020/21 Education Statistical Yearbook, Ministry of Education, Rwanda https://www.mineduc.gov.rw/index.php?eID=dumpFile&t=f&f=41941&token=f2b4cacbfa02e2c86fe309244c7e416180c4d28a

potential to serve as a baseline for future research to answer this question. Therefore, Save the Children, through Together for Early Childhood Evidence funding, expanded the scope of the nationally representative school readiness assessment to i) enhance quantitative data about the quality of pre-primary classroom environments, and ii) build the capacity of government officials and partners to recognize and monitor quality pre-primary learning environments, and to apply that data to improve children's learning using the standardized but contextualized IDELA Classroom Environment observation tool.

Objectives of the Study

The goal of this assessment is to understand the skills with which children are returning to formal schooling. Information about children's strengths and weaknesses will inform teaching practices within schools, and support provided to families and communities outside of school. In addition, information about which groups of children are struggling the most will help to target additional support provided during the 2021 school year and beyond. It is especially important that early primary grades receive additional, targeted support in 2021 given the added stress and possible learning loss experienced during the 2020 school year, and additional students expected in 2021.

The study aimed at contributing to closing an evidence gap on the status of school readiness programming in Rwanda, specifically on the readiness of classrooms and schools to support holistic learning and development needs of boys and girls, with or without disabilities.

With the evidence gathered, it will give an opportunity for discussing data on the quality of learning environments even more critically following changes which occurred during the period of school closure due to COVID-19, such as construction of new classrooms, hiring new teachers, potential disrepair of facilities or materials after prolonged disuse, and potential increased disparity in student skills because of unequal access to remote learning and supportive home learning environments.

Research Questions

The nationally representative IDELA study aimed to answer the following questions:

1. What is the level of children's (both boys and girls) emergent learning and development skills?
2. Do boys' and girls' learning and development skills vary by student background characteristics like sex, social economic status, or home learning environment? Are there equitable outcomes for all children? If so, what does this mean for effectively targeting learning and development programs?
3. Did remote learning programs via radio and TV influence children, both boys and girls, learning and development skills?
4. Is there any association between children's skills and their home learning environment?
5. What are the typical classroom characteristics and teacher behaviors in classrooms at baseline?
6. What is the quality of pre-primary/ECE classroom environments in Rwanda? Are there disparities among classrooms across Rwanda; if so, what are some explanatory variables?

   (The last 2 questions were answered by adding the Classroom Environment tool as part of the wider IDELA study).

II. Methodology

This section describes the proposed methodological approach that was used in collecting data for two assessments.

Study design and sampling

This study employed a quantitative method to assess children's learning and development using a nationally representative sample of enrolled in public pre-primary and P1 classes as of January-February 2021. This includes children entering in grade one (P1) in 2021, and those from the 2020 P1 cohort who repeated the grade because they only received up to 2 months of P1 in 2020 due to COVID-19 related school closures. In addition, a sample of children enrolled in pre-primary classes in 2021 was drawn, a pre-primary class was also selected from sampled primary schools. If no pre-primary class is operating in a selected primary school, another school was randomly selected in the same respective district.

This study used a three-stage clustered sampling design. In the first stage, schools were selected from a national list of all public primary schools. In the second stage, two classrooms in each school were randomly selected: one P1 and one pre-primary. Finally, 10 children were randomly selected from each classroom per cohort of interest (2020, 2021).

Sample

The sample for this study included five schools from each District in Rwanda, with 10 children from Pre-Primary (PPE) and 10 from Primary 1 classes per school, for a total projected sample of 150 schools and 3,000 children. Schools were randomly chosen using a list of all primary schools in Rwanda. Within schools, one PPE and one Primary 1 classroom were selected, and then 10 children within each classroom. Considering the COVID-19 disruption to the 2020 school year, it was decided to select two samples of 10 children per P1 class: those who enrolled in P1 in 2020 and those who are new to P1 in 2021.

The final sample for this study is summarized in table 1. The final sample achieved the target number of schools but had somewhat fewer children than projected because some of the selected children asked to go home for a break and did not come back or some did not finish the interview while they had started it.

Table 1. National study sample, overall

Province	PPE	Primary 1	Total Children	Schools
Kigali city	128	125	253	15
East	330	335	665	35
North	223	224	447	25
South	393	360	753	40
West	303	303	606	35

Total	1377	1347	2724	150

Survey weights

Survey weights were used in any calculation that is estimating outcomes for the population using the sample of collected data. Sampling weights were used on the data from children and teachers so that selected schools were represented in proportion to their prevalence in the general population. In alignment with the sampling frame for this study, we calculated three survey weights to be used in different analyses. We calculated separate survey weights for the PPE and P1 samples to be used in analyses specific to these levels. In addition, we calculated a combined survey weight for both levels together (including students from PPE and P1 classes), which is used in analyses of the overall school conditions. We did not use population weights for other areas, such as summarizing the demographics of the sample.

Data used to calculate survey weights was collected from school leaders at each sampled school, and all but three schools were able to provide the requested data. For the three schools unable to provide the relevant data, we imputed information about school size from information about other schools in the same district. The probability of selection for an individual was calculated as described below. Then the sampling weight for each student is the inverse of the probability of selection.

Sample weight equations:

$$100\%\ of\ districts\ selected\ X\ \frac{\#\ schools\ selected\ from\ district}{\#\ schools\ in\ district}\ X\ \frac{\#\ students\ selected\ from\ school}{\#students\ in\ PPE\ \&\ Grade\ 1}$$

$$100\%\ of\ districts\ selected\ X\ \frac{\#\ schools\ selected\ from\ district}{\#\ schools\ in\ district}\ X\ \frac{\#\ students\ selected\ from\ Grade\ 1}{\#students\ in\ Grade\ 1}$$

$$100\%\ of\ districts\ selected\ X\ \frac{\#\ schools\ selected\ from\ district}{\#\ schools\ in\ district}\ X\ \frac{\#\ students\ selected\ from\ PPE}{\#students\ in\ PPE}$$

Data collection procedures

Procedures for enrolment

Children enrolled in P1 or pre-primary classes at the time of the baseline data collection were eligible to participate in the study. In addition to the target children, a parent or legal guardian were asked to agree to participate. Children with severe language or audio-visual impairment were not included in the national study due to the additional cost associated with appropriately evaluating these children. A teacher of the selected classroom was also interviewed to see if they voluntarily consented to be part of the study and finally classroom observation was done for pre-primary classes.

The selected schools were contacted about participation in the study prior to data collection. If there are multiple P1 or PPE classrooms in a school, one classroom was randomly chosen using the headmasters list. Within the selected classroom, the appropriate number of children were randomly selected using the teacher's class list. Parents of selected children were given the invitation to participate in the study by the teacher and asked to provide the consent by the assessor. If any parent refused to consent, replacement was done using the same random procedures from the remainder of the sampling frame. One parent per child was interviewed, and preference was given to the primary caregiver of the child. All interviews (child and

parent) took place at children's schools. If a child refused to give assent or chose to stop the assessment prior to finishing all tasks, they were not replaced.

Classroom observations of the sampled classrooms were done at later dates by trained district education officers or trained district ECD focal points.

Tools

The study used four tools to capture student learning estimates and information about home and classroom environments.

The tools used in the study were translated and adapted for Rwanda in 2017 and were further adapted by Save the Children staff and government officials during the training. Following this process, the tools were tested and available for continued use by government and other partners beyond the time of this study.

i. International Development and Early Learning Assessment (IDELA)

Save the Children's pre-primary assessment tool called International Early Childhood Development & Learning Assessment (IDELA) was used to assess school readiness skills among children. IDELA is an easy-to-use, rigorous global tool that measures children's early learning and development in 4 domains: Motor Development, Emergent Language and Literacy, Emergent Math/ Numeracy and Social-Emotional Development. IDELA provides users with evidence on the status of children aged 3.5 to 6 years (www.idela-network.org).

Figure 1. IDELA Learning Domains

ii. Caregiver Questionnaire

This study used a questionnaire to capture the knowledge, attitudes and practices of parents/caregivers. Parents/caregivers were assigned a structured questionnaire covering aspects of knowledge, attitudes, beliefs and practices of parents towards how they support school readiness skills at home. Parents/caregivers also reported on their household characteristics and assets.

iii. Teacher Questionnaire

A teacher questionnaire was developed to capture the background of pre-primary teachers and P1 teachers in teaching pedagogy and their knowledge, attitudes and practices around teaching methodology being used. This questionnaire was also complemented with IDELA classroom environment (IDELA CE) observation tool in order to measure the quality of the learning/teaching environment.

iv. IDELA-CE

The IDELA Classroom Environment tool measures quality in four core domains: General Resources, Literacy and Numeracy Instruction and Interactions in the Classroom. With this tool, Save the Children simultaneously built the capacity of the government and selected partners to assess the quality of the learning environment, skills which they can use beyond this study, to monitor and track changes in early childhood education environments, as well as support use of the findings to improve student learning. Participants were selected in collaboration with the Ministry of Education and National Child Development Agency.

Field Arrangements

Data collection was carried out by 36 data collectors from the Save the Children database and trained in using the data collection tools. Six teams were composed, and each team had 1 team leader and 6 data collectors. Save the Children project officers acted as supervisors during data collection. Data was collected digitally using KoBo, a web-based data collection platform (www.kobotoolbox.org).

For IDELA CE- 1 District Education Officer and 1 ECD Focal point per district were trained on how to do quality monitoring using the IDELA Classroom Environment tool. The training included how to carry out quality classroom observations; how to rate classroom environment quality including on the use of gender transformative and inclusive pedagogy; how to interpret, present and report the data; and how to use the data for coaching, supportive supervision and decision making.

In addition, the training included a field pilot and practice to ensure participants are fluent in the use of the tool and to improve inter-rater reliability. A post field pilot reflection included an item-by-item discussion and reflection which informed any adjustment/ enhancement of scoring guidance and/or test items before the data collection. In addition to the above-mentioned training components, Save the Children provided child safeguarding orientation to all participants to ensure the safety of children throughout the research period and research ethics for the ones who collected data with children, caregivers and teachers.

Ethical consideration

The research team sought a research visa from the National Institute of Statistics of Rwanda. To ensure that our research keeps as rigorous and ethically sound as possible, the research team sought ethical approval and continual oversight from the Rwanda National Ethics Committee (RNEC). The protocol number for the ethics review was No. 035/RNEC/2021. In addition, the study was also registered with Save the Children's Ethics Review Committee (ERC). In order to conduct this study nationally, Save the Children was affiliated with the former Rwanda Education Board (now Rwanda Basic Education Board) to collaborate in the whole implementation of this study.

Analysis methods

Estimates of children's school readiness skills were calculated primarily through multivariate regression analyses. Analyses used appropriate sampling weights and clustered standard errors to account for student clustering within classrooms. Summary statistics, such as weighted means and effect sizes were calculated to investigate the prevalence of different outcomes and characteristics for children and teachers.

Data from caregivers and teachers, as well as the IDELA-CE data, were merged with children's learning and development scores to create a comprehensive database. Multilevel multivariate regression analyses were used to determine the relationship between various inputs and children's learning and development (i.e., IDELA scores). Data from teachers and the IDELA-CE are reported at the school-level. STATA version 14 software was used to clean and analyze the data. The threshold for statistical significance used is probability or error less than 95 percent, often denoted as $p < .05$. Study findings will be disseminated to the ECD government institutions, ECD actors, civil society and private sector in an appropriate format depending on the status of COVID-19 in Rwanda.

Limitations

The findings in this study are correlational, and do not imply causation. For example, the finding that children who accessed remote learning opportunities have more advanced learning and development in multiple domains should not be interpreted as remote learning causing advanced learning. These findings could also be related to exogenous factors not accounted for in this study, like a child's intrinsic motivation to learn or their family's enthusiasm for education. In addition, this study attempted to triangulate information about the situation in early grades through the engagement of numerous stakeholder groups (i.e., children, teachers and parents). However, this study does not use qualitative methods to triangulate findings from the quantitative tools and analysis, and therefore may have missed information about individual's lived experiences or other nuances related to the current conditions in early grade classrooms.

III. Results

Children's Learning and Development

The results in this section describe children's learning and development as they re-entered school in June 2021, after more than 9 months of school closures. On average, children in PPE classes were approximately 5 years old (range x - y), and children in Primary 1 were 6.9 years old (range x - y) (table 2 and 3). Slightly more than half of the sample in both grade levels is female. On average, 1.8 percent of children in PPE were identified as having a disability, compared to 3.2 percent of children in Primary 1. We do not know the reason that more children in P1 were identified as having a disability, but it is likely related to the much larger proportion of children who enroll in P1 compared to PPE.

On average across Rwanda, 14.9 percent of children in PPE were reported to have followed remote classes during COVID-19 school closures, as well as 25.7 percent of Primary 1 students. Children living in Kigali City were most likely to access remote classes, and children in the Western Province were the least likely to have accessed remote classes (34.6 percent compared to 9.6 percent) (table 2). Most children accessed remote lessons via radio (79 percent), followed by television (12 percent) and then mobile phones (4 percent).

Table 2. National study sample child demographics: PPE

PPE					
Province	Age	% Female	% with Disability	% Enrolled in 2021	% Followed remote COVID classes
Kigali city	5.1	53.9%	0.0%	52.9%	34.6%
East	5.2	53.3%	2.7%	61.7%	17.5%
North	5.3	52.9%	2.6%	48.7%	7.2%
South	5.1	56.2%	2.0%	42.4%	15.2%
West	5.1	51.8%	0.6%	45.2%	9.3%
Total	5.1	53.8%	1.8%	49.3%	14.9%

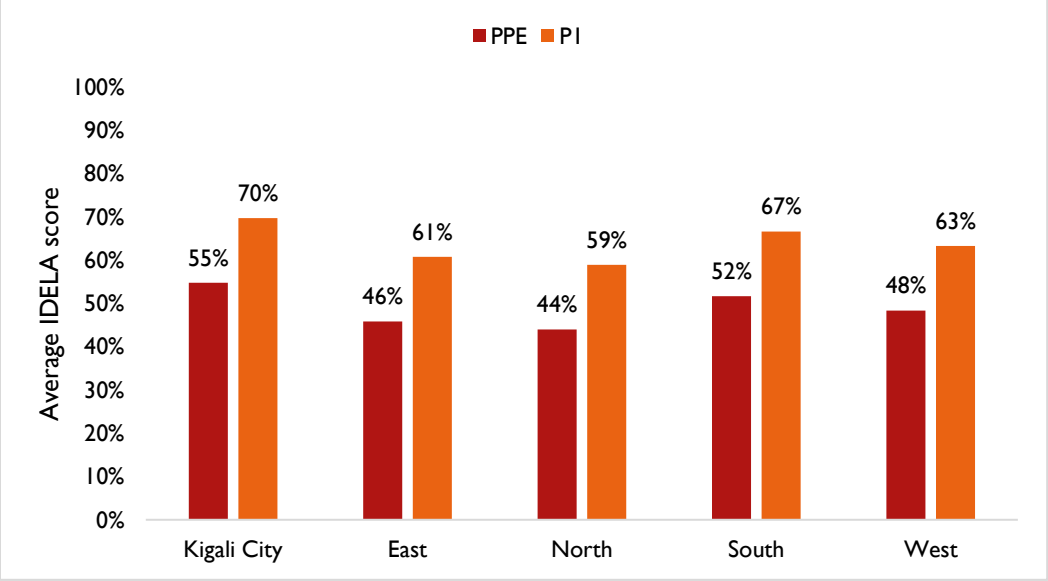
Table 3. National study sample child demographics: P1

Primary 1					
Province	Age	% Female	% with Disability	% Enrolled in 2021	% Followed remote COVID classes
Kigali city	6.7	52.8%	2.4%	46.5%	44.0%

East	7.0	53.1%	5.6%	72.8%	31.7%
North	7.0	48.2%	2.2%	69.1%	25.1%
South	6.8	51.7%	2.8%	55.0%	24.6%
West	6.9	53.1%	2.3%	59.0%	13.9%
Total	6.9	51.8%	3.2%	61.4%	25.7%

We find that children living in Kigali City demonstrated significantly more advanced skills than their peers in other Provinces in all domains. As expected, we also find that children enrolled in Primary 1 classes demonstrated significantly more advanced skills in all learning domains compared to children enrolled in PPE classes (figure 2). The largest differences between children's skills in grade levels were observed in the areas of emergent literacy and numeracy (appendix table 1). We also found that children who were enrolled in the target grade prior to the COVID-19 school closures had significantly stronger skills compared with children who were enrolling for the first time in 2021 in all domains.

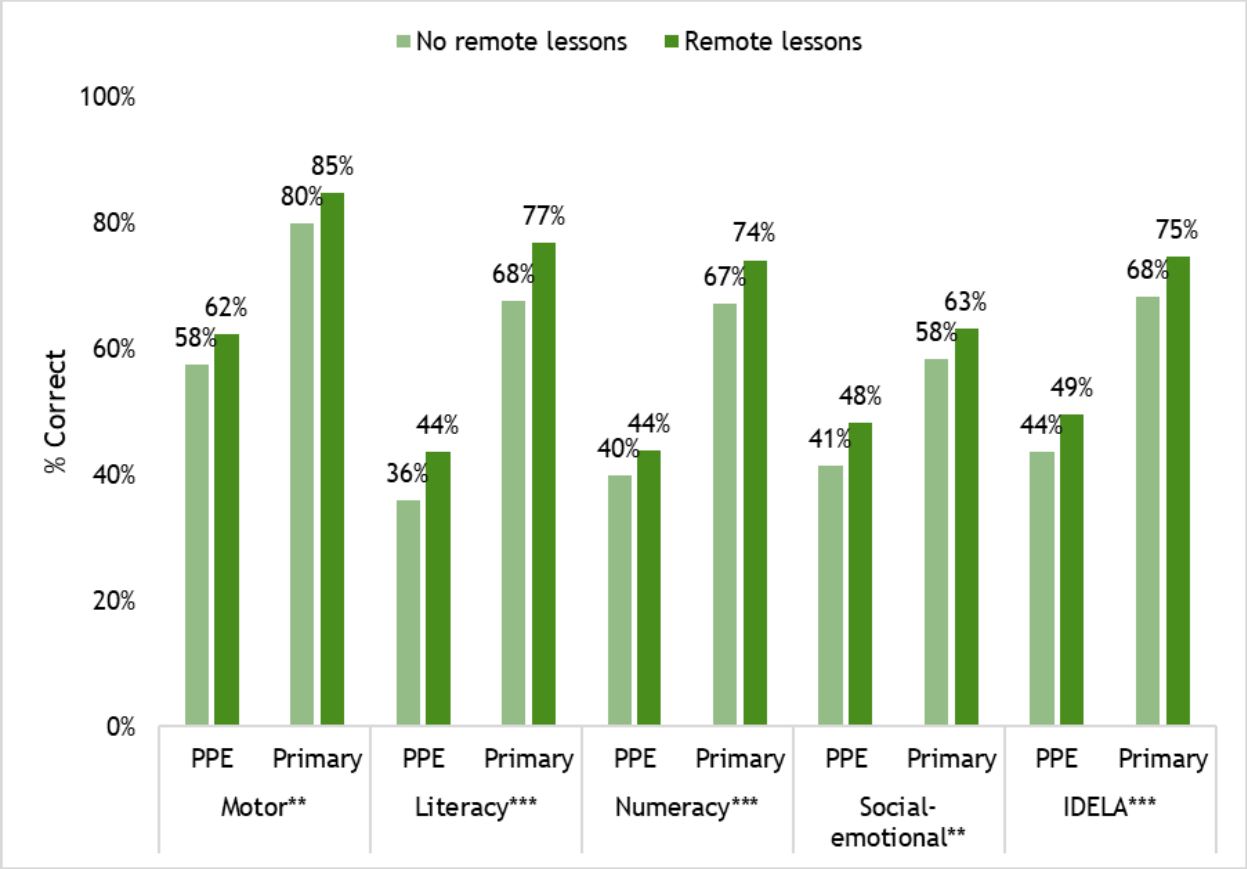
Figure 2. Average Total IDELA scores by Province and grade level (raw weighted average)



For children in both grade levels, those who reported accessing remote learning opportunities while schools were closed, had significantly stronger skills in all domains. The largest difference in children's skills was found in emergent literacy and the smallest was in social-emotional development. Children who reported accessing remote classes demonstrated emergency literacy scores which were .27 standard deviations higher than their classmates who did not access these lessons (appendix table 2 for standardized scores). To put this result in context, we can compare it to the difference between children's skills in P1 compared to PPE. In this study, children in P1 scored an average of .90 standard deviations higher than children in PPE in emergent literacy, so we can take this as the approximate amount of literacy skills gained in a given school year as measured by the IDELA tool. Compared with the .27 standard deviation difference between children who did or did not access remote lessons, this suggests that remote lessons were associated with

the equivalent of approximately one-third of a school year's worth of literacy learning. It's important to note that this relationship is correlational and not causal. However, it is a significant and meaningful relationship across learning domains.

Figure 3. Children's learning and development, by access to remote lessons during COVID-19 school closures (raw weighted average)



Note: *p<.05, **p<.01, ***p<.001

Table 4. Percent correct on IDELA subtasks, by access to remote lessons during COVID-19 school closures (raw weighted averages)

	PPE		Primary 1	
	No remote learning lessons	Accessed remote lessons	No remote learning lessons	Accessed remote lessons
Measurement	84%	84%	95%	95%
Sorting	35%	43%	50%	58%
Shape Identification	37%	40%	44%	54%
Number Identification	24%	31%	76%	87%
One-to-one Correspondence	45%	52%	89%	93%
Simple Operations	42%	43%	82%	85%
Puzzle Completion	13%	12%	30%	45%
Total Emergent Numeracy	**40%**	**44%**	**67%**	**74%**

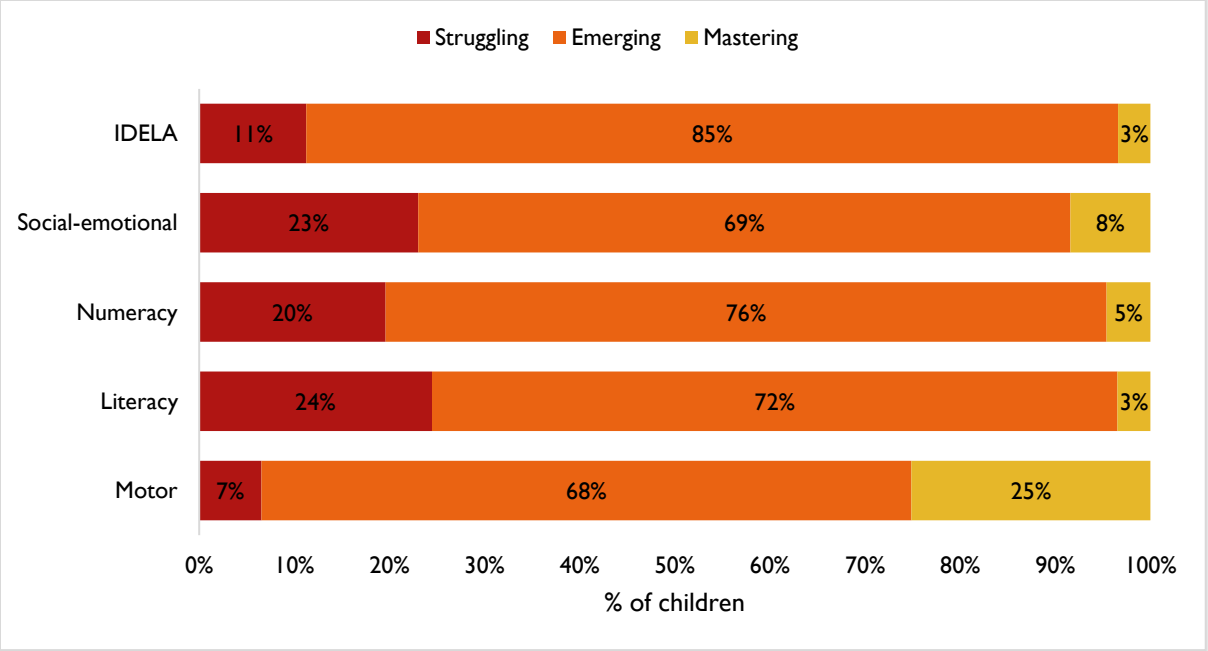
Self-Awareness	67%	71%	79%	81%
Friends	41%	48%	54%	55%
Emotional Awareness	32%	39%	49%	57%
Empathy	30%	36%	49%	58%
Solving Conflict	39%	44%	59%	62%
Total Social-emotional Development	**42%**	**48%**	**58%**	**63%**
Expressive vocabulary	42%	49%	58%	62%
Print Awareness	46%	60%	78%	88%
Letter Identification	8%	12%	55%	71%
Phonemic Awareness	15%	22%	54%	64%
Emergent Writing	44%	52%	79%	89%
Oral Comprehension	61%	69%	79%	82%
Total Emergent Literacy	**36%**	**44%**	**67%**	**76%**
Drawing a person	58%	65%	87%	89%
Folding	25%	30%	47%	60%
Copying a Shape	59%	66%	90%	94%
Hopping	88%	89%	94%	95%
Total Motor Development	**58%**	**63%**	**80%**	**84%**

Note: The frequency or duration of access to remote lessons during school closures is unknown. These data represent children who reported ever accessing remote lessons.

Overall, for PPE students in Rwanda, we see that the majority of children are re-entering schools with "Emerging" learning and development skills as measured by the IDELA tool (figure 4). IDELA tool developers define "Mastering" content of the assessment to be children who answer at least 75 percent of the assessment questions correctly, whereas "Struggling" is defined as children who correctly answer less than 25 percent of the assessment content. Emerging skills are defined as scores between 25 - 75 percent correct, suggesting that children have strengths and weaknesses on different tasks but are actively engaging with the content and developing skills. This is a typical skill level for children at the early childhood education level.

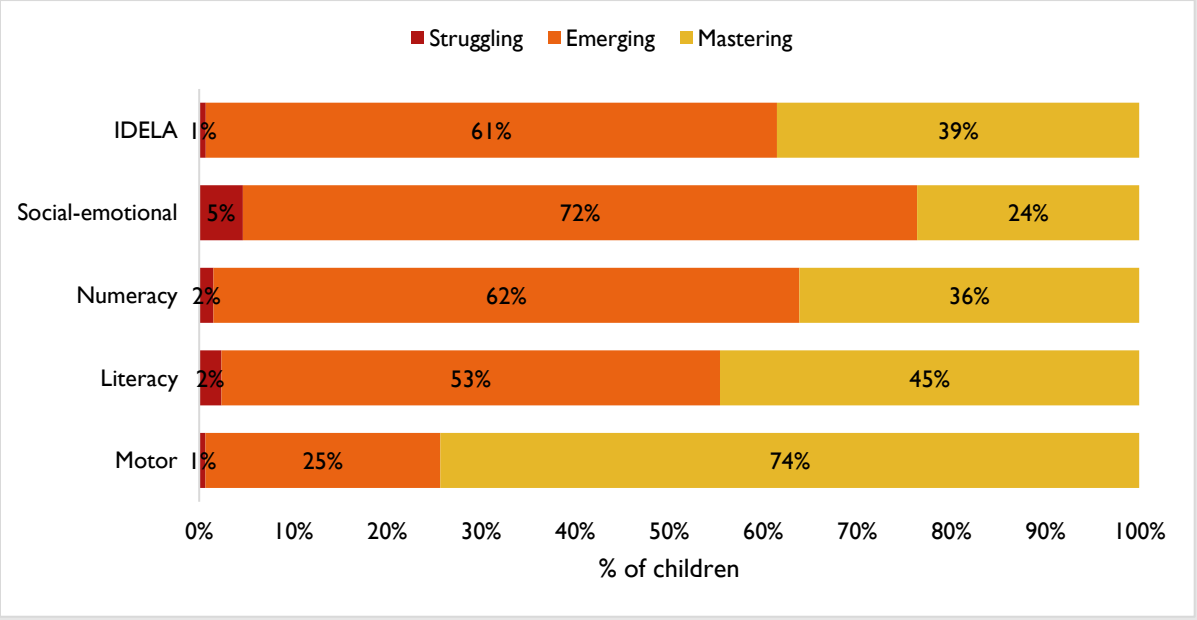
Only 3 percent of children were demonstrating mastery of the IDELA content at the time of the assessment, whereas 11 percent were struggling with the assessment content. Students were struggling most in the areas of literacy and social-emotional development, and least in motor development.

Figure 4. Proportion of PPE students mastering IDELA content, by domain



Looking at P1 students, we see that more children are mastering the skills represented in the IDELA, and fewer are struggling with these skills (figure 5). However, the majority of P1 students still demonstrate emerging skills in literacy, numeracy and social-emotional development which suggests that more could be done in the early childhood and pre-primary years to prepare these children for primary school.

Figure 5. Proportion of P1 students mastering IDELA content, by domain



Similar to the overall results, we also found differences by Province. Children living in Kigali City were more likely to be mastering school readiness content and less likely to be struggling compared to children in other Provinces (figure 6 and figure 7). Children in the Northern Province were the most likely to be struggling with IDELA school readiness skills at the time of this study.

Figure 6. Proportion of PPE students mastering IDELA content, by Province

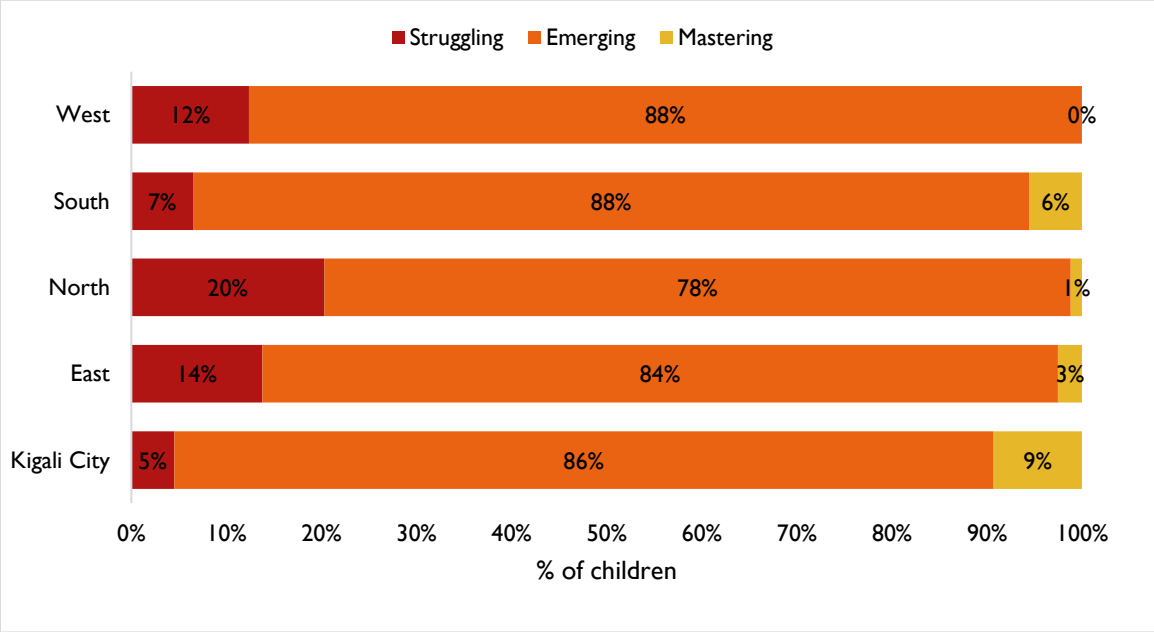
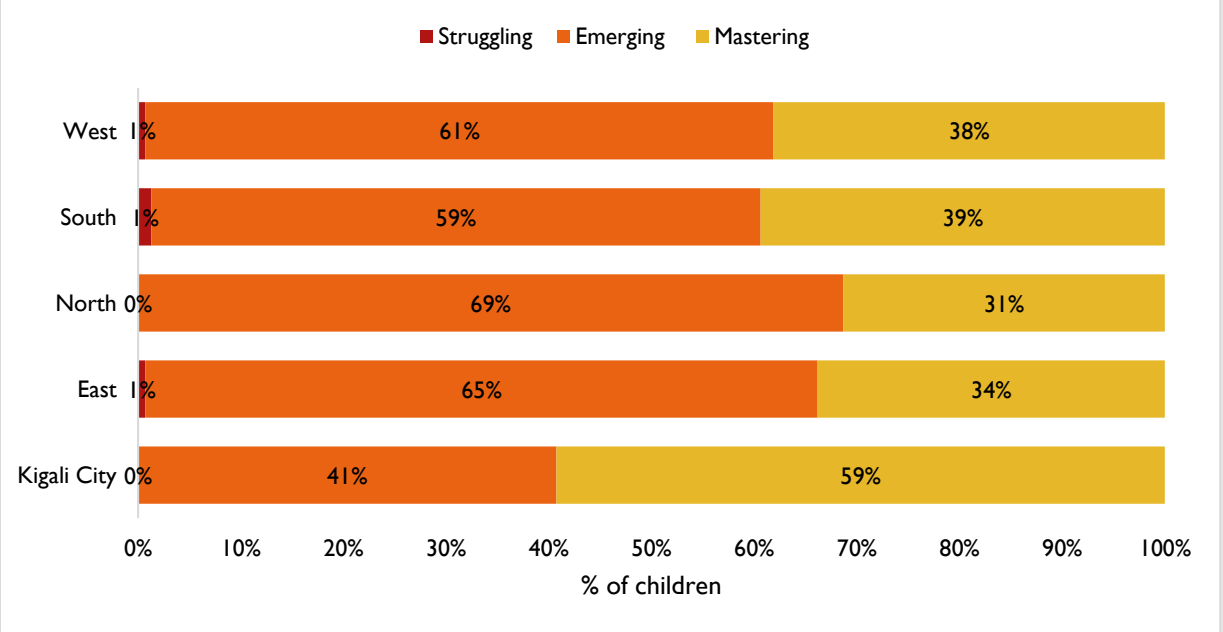


Figure 7. Proportion of P1 students mastering IDELA content, by Province



Homes & Families

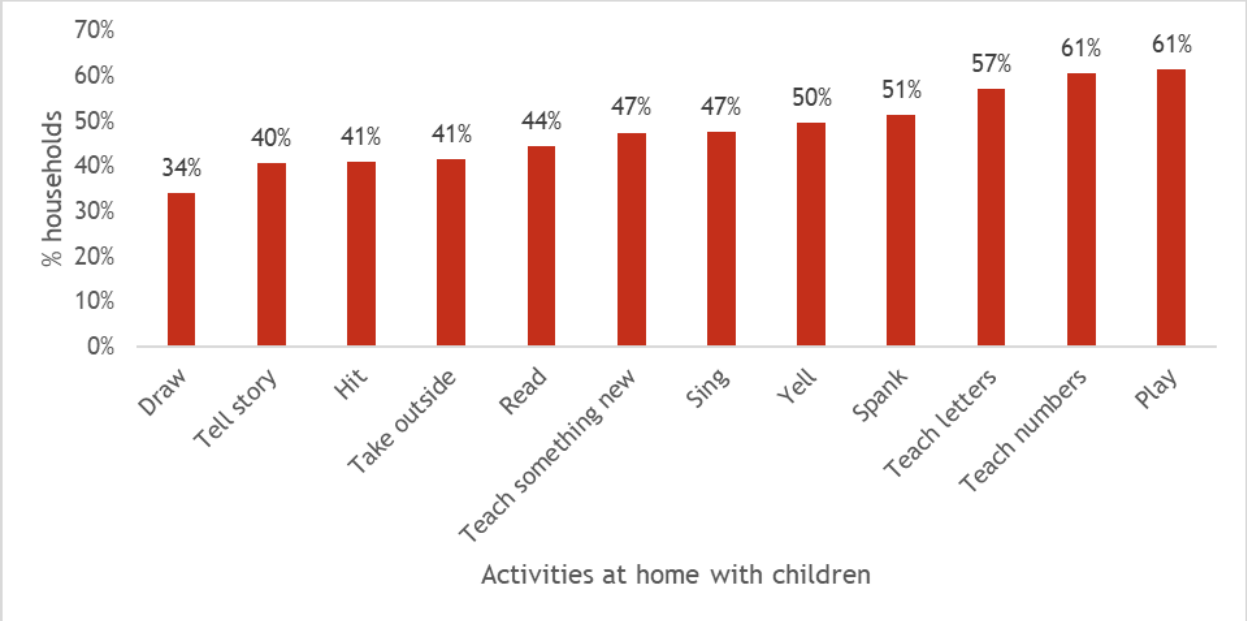
Families in this study were similar across the PPE and Primary 1 cohorts. Mothers were approximately 35 years old and fathers were slightly older (38.7 years, on average). Caregivers reported that approximately 88 percent of mothers and fathers were literate. On average, households had 3.4 children and possess 4-5 common assets out of 11 (e.g., television, radio, bicycle, livestock, etc.).

Households were relatively poor in terms of child-friendly learning materials. On average, caregivers reported owning 4 out of 15 possible types of toys and books (e.g., storybooks, textbooks, comics, homemade toys, drawing materials, etc.) (table 6). Caregivers reported engaging in 4 out of 9 learning and play activities with their children in the past week, and 1.4 out of 3 harsh discipline activities, on average. The top 5 activities that parents reported engaging in with their children in the past week were playing, teaching letters, teaching numbers, spanking and yelling (figure 8). Taken together this suggests that children experienced relatively low levels of stimulation at home during lockdown periods, and also faced harsh physical and emotional discipline.

Table 5. Family demographics for children in PPE and Primary

	PPE	Primary	Total
Mother age	34.6	36.6	35.6
Mother is literate	90.4%	85.0%	87.7%
Father age	37.9	39.5	38.7
Father is literate	90.4%	85.6%	88.0%
Number of children in the home	3.2	3.6	3.4
Total household assets (out of 11)	4.9	4.4	4.7
Total book and toy types at home (out of 15)	4.1	4.0	4.1
Total home learning activities (out of 9)	4.6	4.1	4.3
Total harsh discipline practices (out of 3)	1.5	1.4	1.4

Figure 8. Home learning and discipline activities



Considering the impact of COVID-19 on families of PPE and P1 children, caregivers report multiple changes to their livelihoods and wellbeing. On average, 68 percent of families report losing income due to COVID-19. In addition, 41 percent of caregivers report feeling nervous or stressed fairly or very often (figure 9). Caregivers reported engaging in a number of different types of self-care activities to help cope with stress, most commonly praying (figure 10). Despite the income loss and stress reported in parents, the majority of parents reported that they did not notice their children acting out or crying more than usual (83%) (figure 11).

Figure 9. Caregiver-reported feelings of nervousness of stress

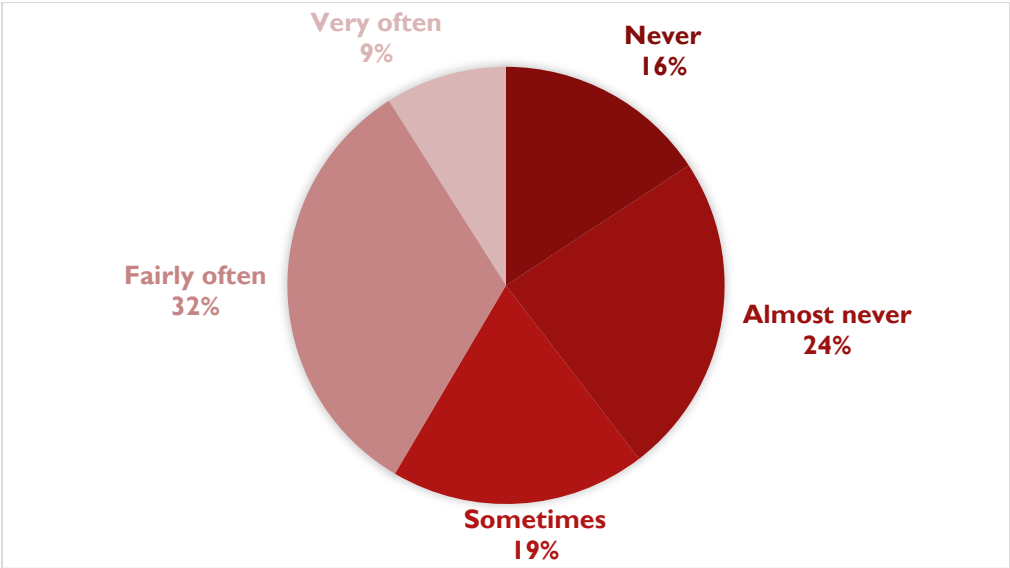


Figure 10. Caregiver reported stress coping mechanisms

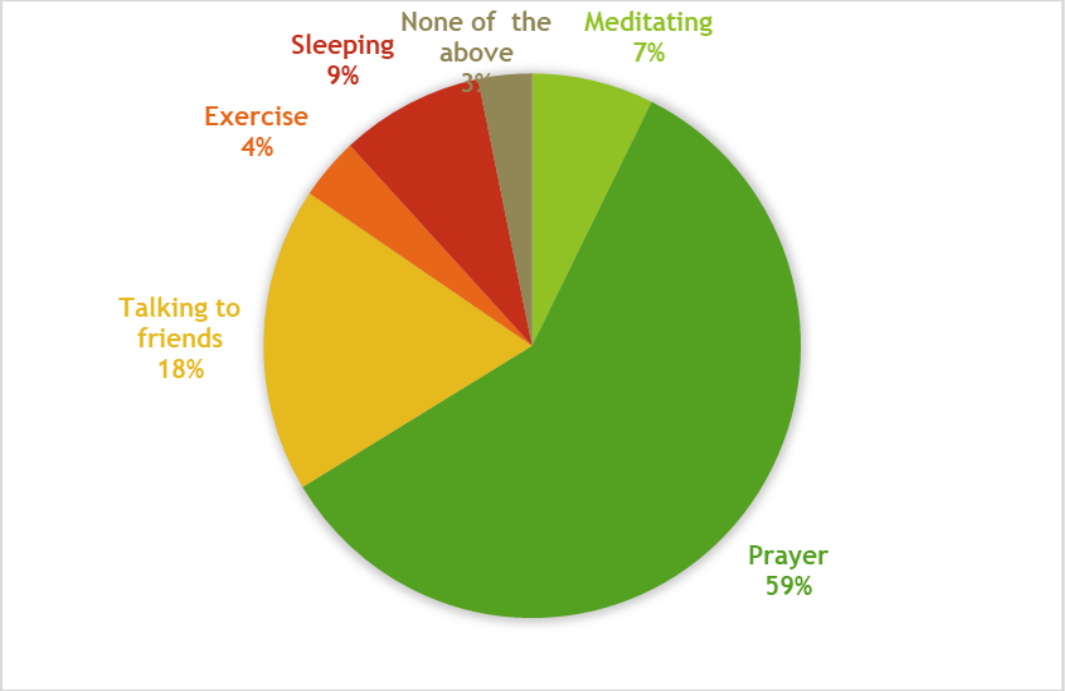
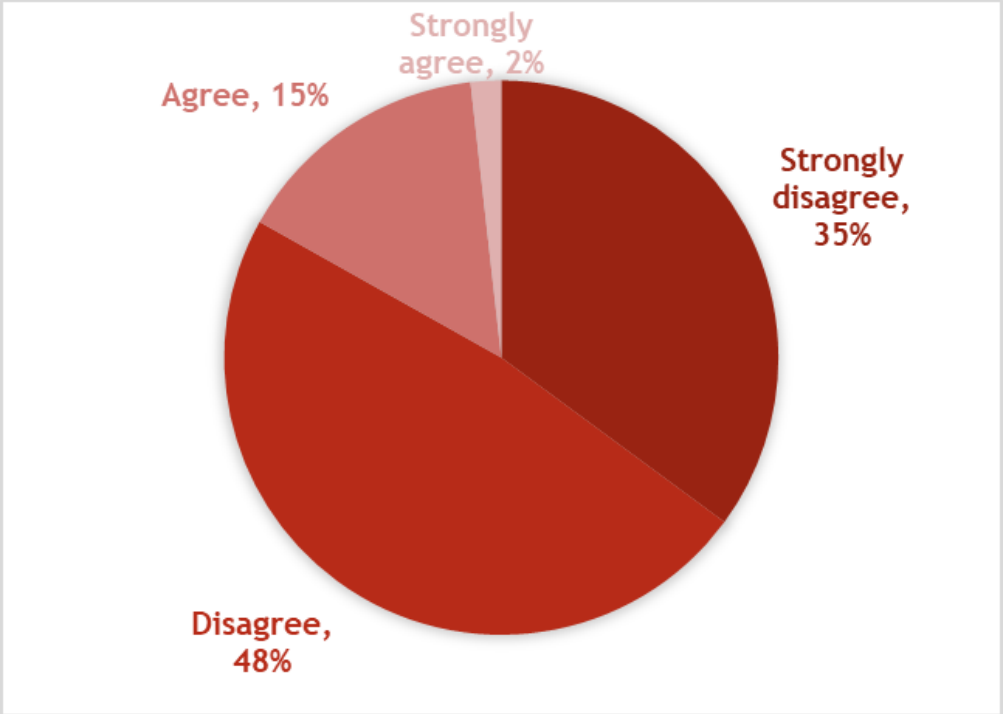


Figure 11. Children are acting out or more upset than usual



These survey questions were exploratory, as the mechanisms by which children's learning has been affected by COVID-19 school closures is still emerging, and we did not find significant associations between these caregiver stress factors and children's learning levels at the time of this study. However, we did find

substantial relationships between other home factors and children's learning and development. Specifically, children from wealthier households, and those with more learning materials (e.g., toys and books) and more home learning activities (e.g., reading, storytelling, playing) demonstrated significantly strong learning and development skills than their peers with fewer of these resources at home (figure 12 and figure 13). In addition, children who experienced more harsh discipline (such as yelling, hitting, spanking) at home demonstrated significantly weaker skills in motor development, literacy and the total IDELA score (appendix table 3).

In addition, we find that the impact of accessing remote COVID-19 lessons remains significant, even after taking other family and household factors into consideration. That is, even after accounting for factors like children's family wealth and home environment, those who reported accessing remote lessons during the school closure period demonstrated significantly stronger learning and development skills in all domains except social-emotional development (.09 - .20 SDs) (appendix table 3). The magnitude of the effects is similar to that which could be expected from in-person interventions meant to improve the quality of student learning, which is fairly remarkable given the speed with which these programs were developed, the novelty of the delivery system, and the overall uncertainty and challenge presented by the COVID-19 school closure periods. We do not have information about how often children accessed remote lessons during the school shutdown period, but this would be a useful direction for future research. Learning more about how or why children accessed these lessons, frequency of attendance, and their experiences with the content would be useful for future planning of remote-learning efforts.

Figure 12. Predicted IDELA score by access to learning materials at home and remote learning during COVID-19 school closures

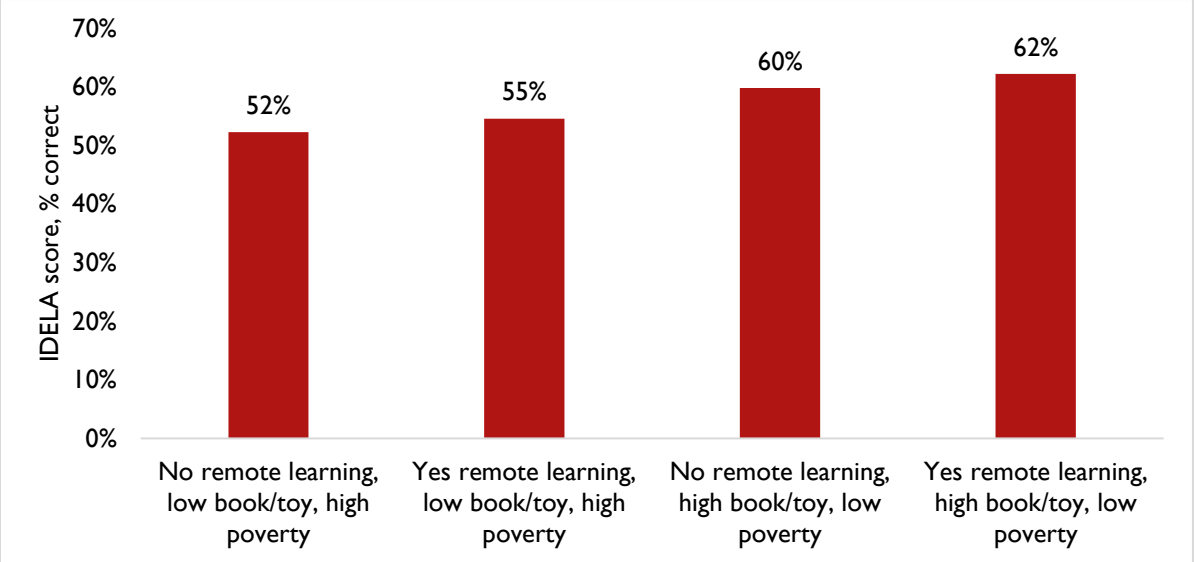
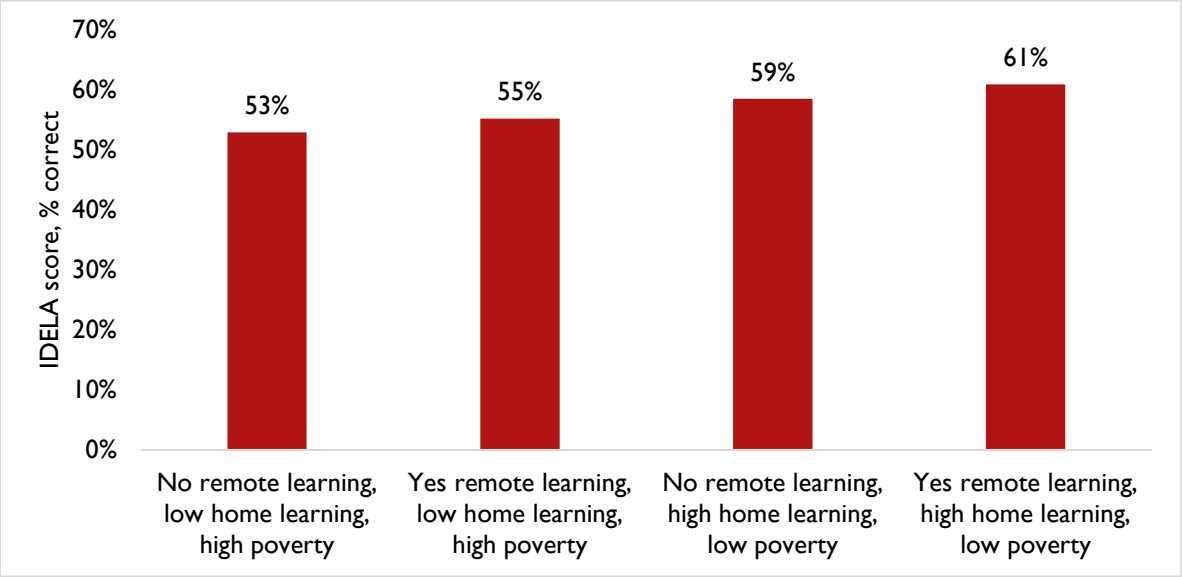


Figure 13. Predicted IDELA score by different learning activities in the home and access to remote learning during COVID-19 school closures



Teachers

Teachers for each of the selected PPE and Primary 1 classrooms responded to a questionnaire about their experience with teaching during and after COVID-19 lockdowns. As of June 2021, PPE and Primary 1 teachers in Rwanda selected for this study were predominantly female (88%), approximately aged 34 years (table 7). We found substantial differences between the professional teaching at the PPE level compared with those in Primary 1. Primary level teachers tend to have more years of experience teaching overall, and at their current school. In addition, primary level teachers are more likely to have been formally trained as a teacher, whereas PPE level teachers are more likely to have a qualification in a different field. Importantly, we also find that all Primary level teachers are paid salaries through the government, whereas only 23 percent of PPE teachers are on the government payroll.

Both groups of teachers report having morning and afternoon classes with large numbers of students. On average, PPE teachers report having 49 children in each class and Primary 1 teachers report having 44 children.

Table 6. Teacher demographic characteristics

	PPE	Primary	Total
Teacher is male	9.9%	13.7%	11.8%
Teacher age	29.3	39.1	34.3
Years of teacher	4.8	13.8	9.4
Years teaching at this school	4.1	10.3	7.2
Completed secondary education	91.6%	96.6%	98.1%
Educated as a teacher	29.6%	88.4%	59.4%
Educated in another field	70.4%	11.6%	40.6%
Teacher on gov't payroll	23.2%	100.0%	62.2%
Not gov't but paid	98.1%		98.1%
Morning class size	50.3	44.0	47.01
Afternoon class size	48.4	43.8	45.1866

Teachers reported a range of changes to their attitudes toward teaching and classroom practices related to COVID-19. When asked if COVID-19 has changed how they related to students, PPE and P1 teachers commonly reported feeling more stressed and having a higher temper (figure 11). Despite reporting elevated levels of stress, teachers also typically reported feeling motivated to teach and adequately prepared to teach after the lockdowns had ended. PPE and P1 teachers most commonly answered that they felt more motivated now to teach than prior to COVID-19 (figure 12). In addition, the majority of teachers reported feeling prepared to teach after the months of lockdown (figure 13). The reasons behind teachers' motivation and details about their preparation to teach were not captured in this study. Further interviews or focus groups with teachers to discuss these topics would be useful to dig deeper into these findings in different communities.

Figure 14. Teacher feelings of relating to students post-COVID-19 lockdown period

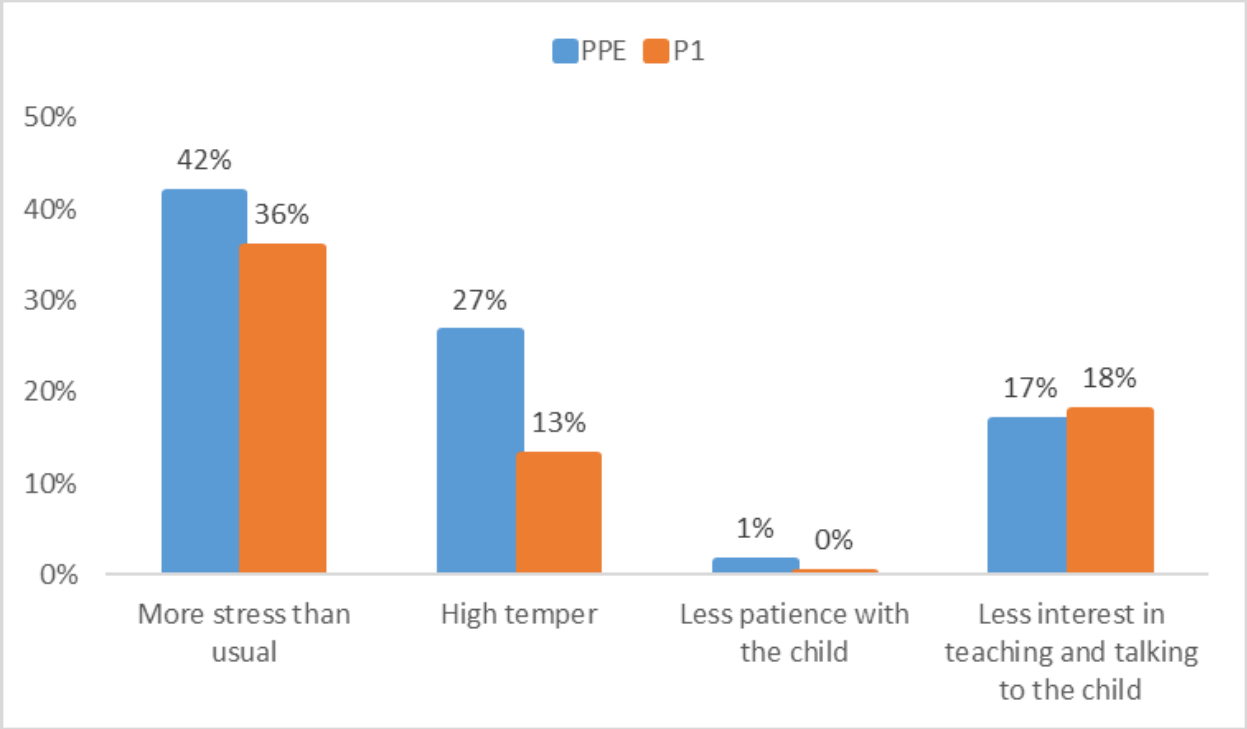


Figure 15. Teacher motivation post-COVID-19

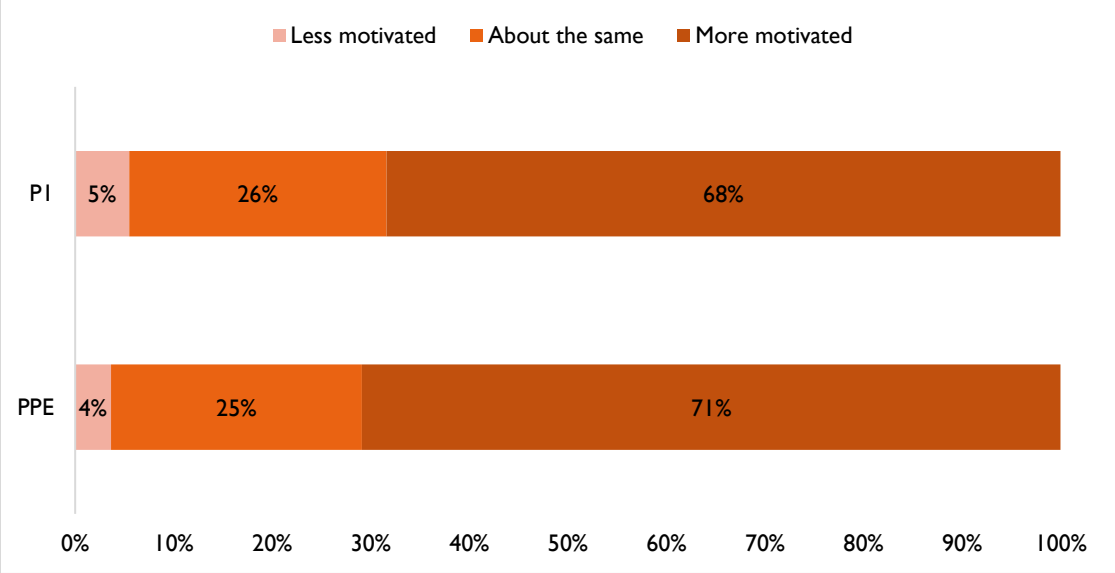
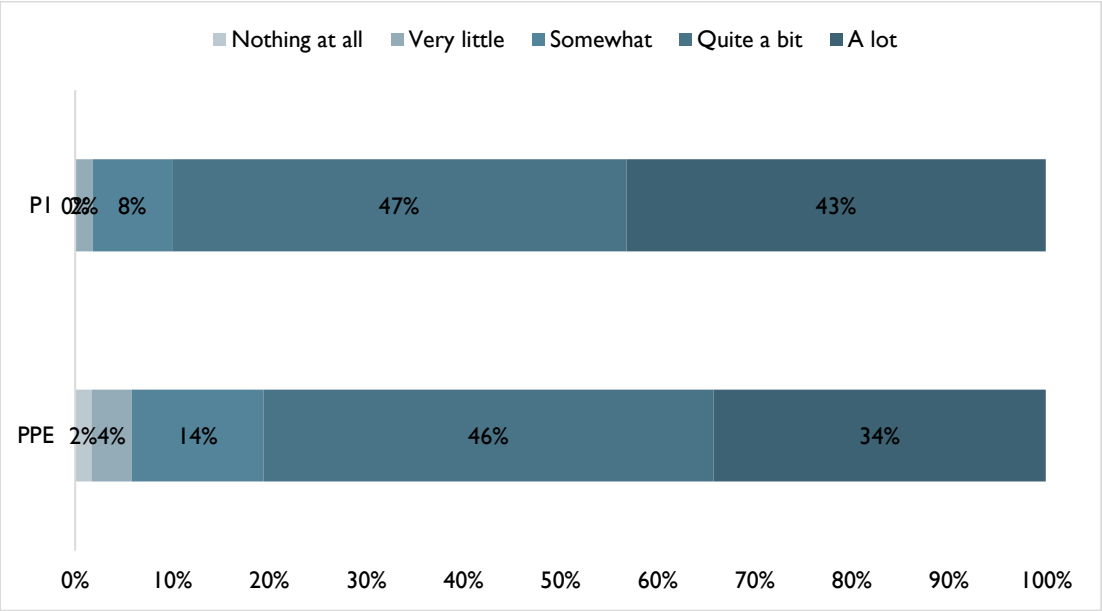


Figure 16. Teachers feeling prepared to teach after months of lock-down



Teachers were also asked questions about what motivated and challenged them to teach in general (table 8). On average, teachers most commonly reported being motivated when students understand their lessons and when students participate in class. The challenges most frequently reported include teaching students with special needs, dealing with students who come to lessons without materials, and teaching students who come late to class.

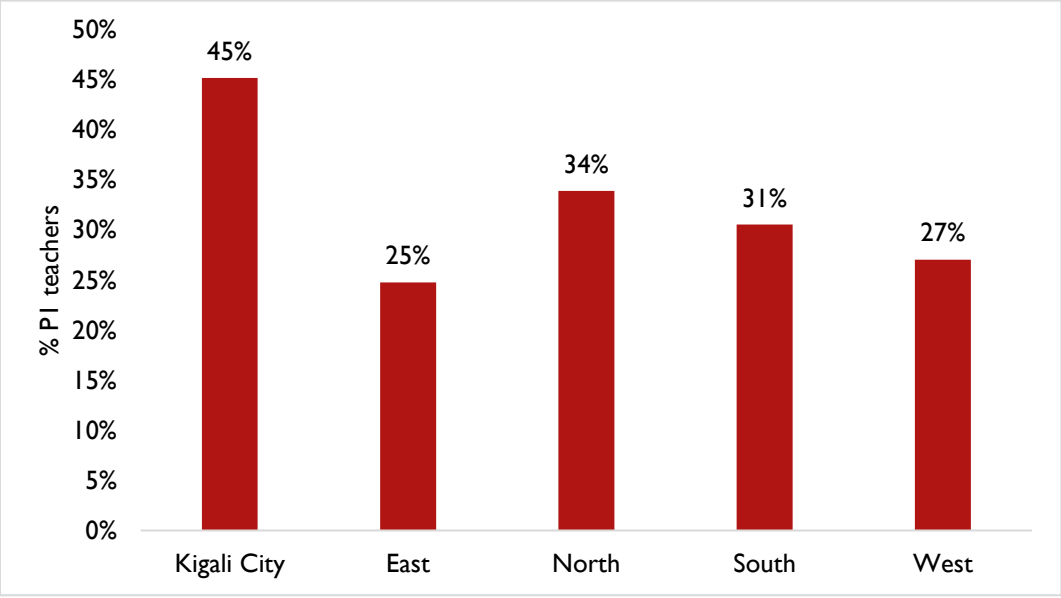
Table 7. Motivating and challenging factors for teachers, by grade level

	PPE	P1	Total
Most enjoyable activities in the classroom			
Realizing students understand the lesson I give or what I teach	60%	78%	69%
When students participate in my lesson	54%	62%	58%
Helping students learn to read and write	18%	19%	18%
Evaluating student's learning	16%	15%	16%
Playing Maths and Literacy indoors with children	19%	10%	14%
Interacting with students	33%	29%	31%
Teaching a new lesson	15%	16%	15%
Reading stories	15%	10%	12%
Playing outside with children	15%	10%	12%
Singing and dancing with children	43%	15%	29%
Most challenging activities in the classroom			
Dealing with students forgetting what has been taught	17%	24%	20%
Seeing a student who can't read or write	16%	19%	18%
Teaching students with special needs	25%	28%	26%
Teaching students who come late to class	23%	27%	25%
Dealing with students' distraction during class/indiscipline	19%	14%	17%

Engage students with personal problems (e.g. hungry, tired, etc)	18%	18%	18%
Punishing/disciplining students	14%	7%	11%
Teaching students with very few text books/no textbooks	15%	20%	17%
Dealing with students coming to lesson with no materials	25%	27%	26%
Using the curriculum I was not trained on	14%	3%	8%
Deal with noise in the classroom/another classroom	13%	12%	12%
Having to teach letters, syllables or words	5%	2%	3%
Engaging students who have been absent	11%	12%	11%
Teaching in a crowded classroom (space)	20%	15%	17%
Teaching and engaging a high number of students	10%	7%	9%
Teaching in a sunny day – the classroom gets hot	5%	1%	3%
Teaching students uncapable of learning	8%	10%	9%
Teaching class with a mixture of young and over-age children	17%	7%	12%
Nothing	8%	6%	7%
Struggling with the methodology to teach young children.	5%	3%	4%
Dealing with children who come to school unclean	1%	1%	1%
Dealing with children who come without any refreshment when others have it	2%	3%	3%

For P1 teachers, the motivation factor most highly correlated with children's assessment scores was interest in interacting with children. While this correlation is not causal, it does suggest that teachers who inherently enjoy interacting and spending time with young children may support more effective learning in classrooms. We found that substantially more teachers report being motivated by their interactions with students in Kigali City compared to other areas of the country.

Figure 17. Proportion of P1 teachers motivated by their time interacting with children, by Province



Schools Environment

In addition to a teacher survey, government representatives used the IDELA-Classroom Environment (CE) tool to observe the quality of PPE classrooms from June - September 2021. These data were collected through school visits from government monitors, during which the monitors rated different aspects of the classroom materials and activities using a 3-point scale (1=Poor, 3=Fair/Acceptable, and 5=Good quality).

Data from these observations demonstrate that, on average, classrooms in this study had acceptable levels of classroom and health resources (table 9). Overall, the highest rating was for interactions in the classroom - between teachers and children as well as between children - which suggests that the classroom environments are conducive to collaboration and learning. Ratings of literacy and numeracy teaching practices and overall interactions in the classroom were observed to be acceptable. The lowest scores were around following a daily schedule or routine. However, there was a large range of scores in each area for schools across the country, with some demonstrating very poor quality and others with very high quality. So there is work to be done to ensure consistent quality of teaching and learning spaces in PPE throughout the country.

Table 8. Average IDELA-CE domain scores, all PPE observations

	Mean	Std. Dev.	Min	Max
General Classroom Resources	3.0	0.87	1.0	4.9
Classroom Organization	3.1	0.93	1.0	5.0
Health and Sanitation	3.2	1.06	1.0	5.0
Daily Schedule	2.7	1.34	1.0	5.0
Daily Routine	2.8	1.30	1.0	5.0
Literacy & Numeracy Environment	3.1	1.04	1.0	5.0
Interactions	4.1	0.75	1.8	5.0
IDELA-CE Total	3.4	0.79	1.7	4.9

New figure. Range of IDELA-CE Scores, By Province

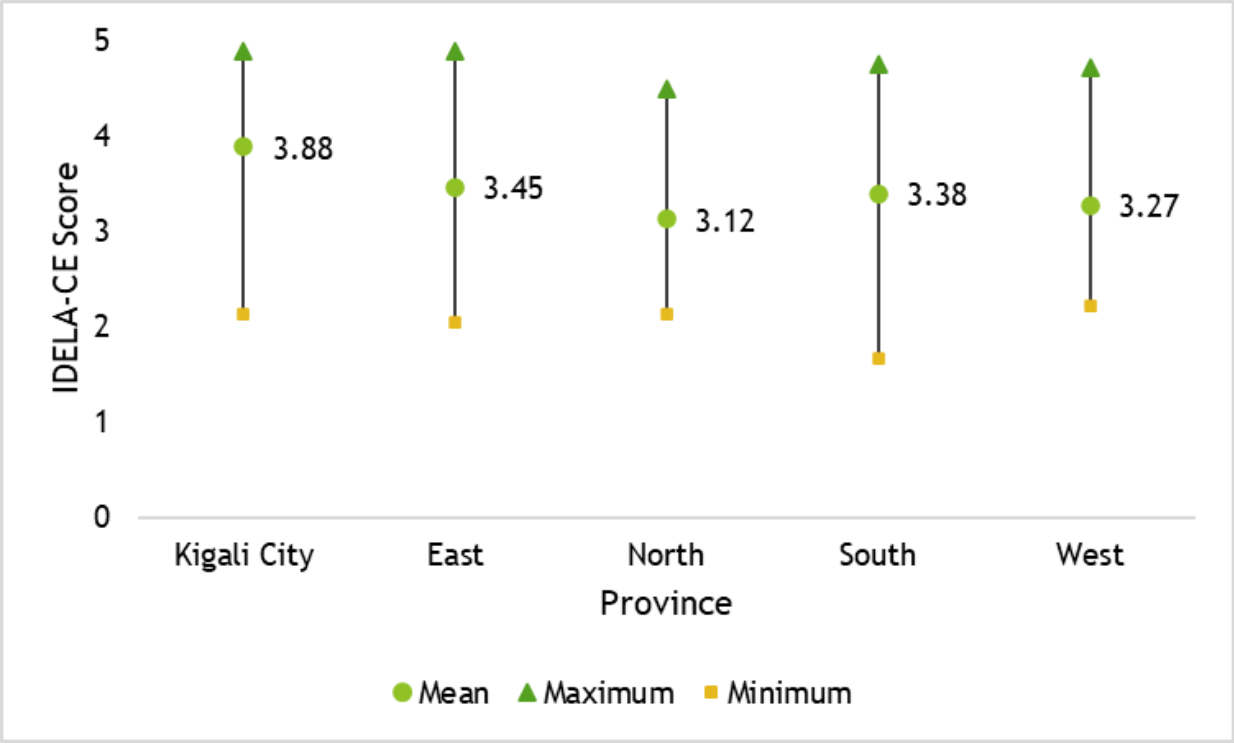
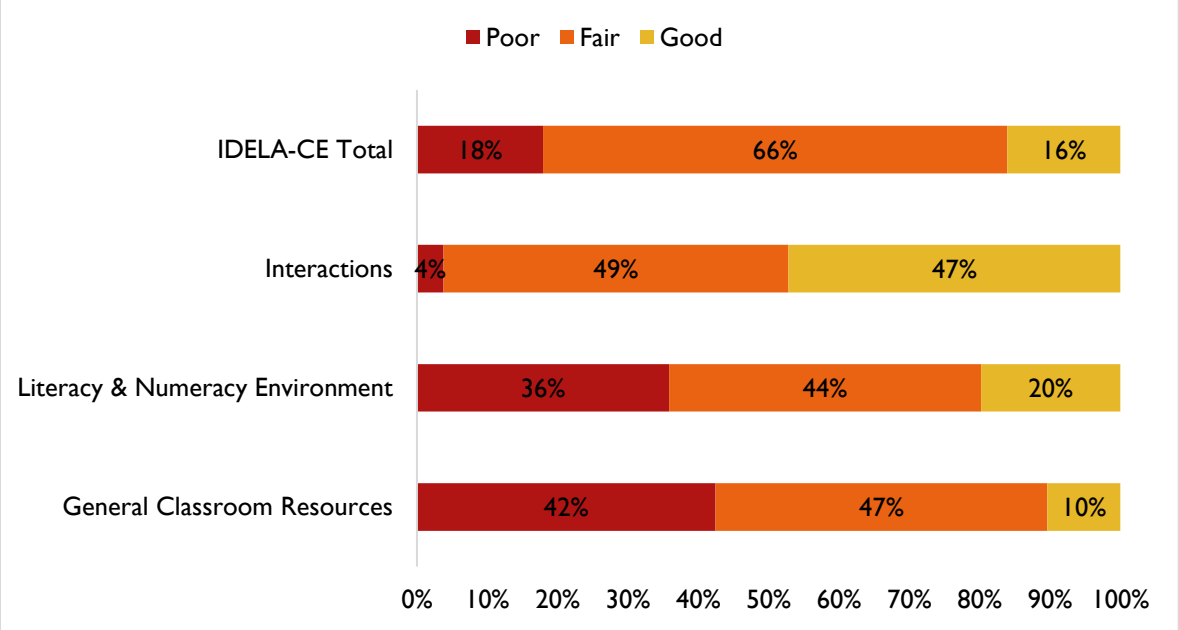


Figure 18. Average IDELA-CE domain scores, categorized



On average, PPE classrooms in Kigali City were found to be higher quality than classrooms in the North, South and Western Provinces (no difference with East Province). Patterns of quality were similar across Provinces, with interactions within classrooms rated more highly than other categories, and issues with general classroom resources (table 9).

Table 9. Average IDELA-CE domain scores (scale 1 – 5), by province

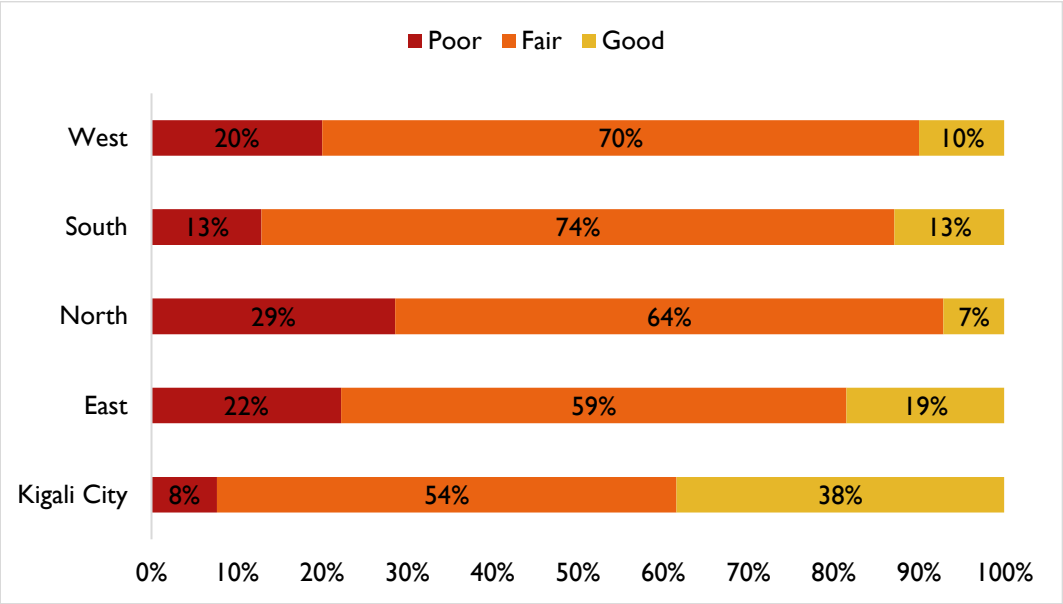
	Kigali city	East	North	South	West	Total
General Classroom Resources	3.4	3.1	2.5	3.1	2.9	3.0
Size of classroom	4.5	4.6	4.0	3.8	4.1	4.2
Arrangement of classroom	3.3	4.2	3.4	3.5	3.6	3.6
Cleanliness of classroom	4.5	4.0	3.7	4.0	3.4	3.9
Furniture	4.1	3.9	2.3	3.1	2.8	3.3
Learning areas: Space	3.2	2.6	2.0	2.3	2.2	2.4
Learning areas: Materials	3.2	2.2	1.9	2.1	2.2	2.2
Gross motor: Space	3.2	4.0	2.6	3.3	3.5	3.4
Gross motor: Materials	2.7	2.2	1.3	1.8	1.6	1.9
Toilet facilities	3.9	3.4	2.4	3.9	2.8	3.4
Handwashing facilities	3.2	3.1	2.4	3.8	3.1	3.2
Handwashing practices	3.2	2.6	2.1	3.6	3.2	3.0
Daily schedule content	3.5	2.0	1.7	2.4	2.2	2.3
Daily schedule teacher use	3.2	2.5	2.3	3.1	2.5	2.7
Daily schedule preparation	3.3	2.9	2.6	3.2	3.1	3.0
Daily routine content	3.3	2.4	2.1	2.6	2.9	2.6
Daily routine teacher use	3.0	2.6	2.3	2.8	2.6	2.7

Daily routine preparation	3.2	3.1	2.6	3.2	3.4	3.1
Literacy & Numeracy Environment	3.8	3.1	2.9	3.0	3.1	3.1
Print environment	3.6	2.5	2.6	2.4	2.4	2.6
Letter/word reading activities	4.1	3.7	3.6	3.2	3.1	3.5
Book environment	3.2	2.4	2.4	2.4	2.4	2.5
Book reading activities	3.9	3.4	3.0	3.1	3.4	3.3
Oral language use	3.9	3.7	3.7	3.8	3.9	3.8
Oral language improvement	4.2	3.2	3.1	3.5	3.5	3.5
Printed number environment	3.5	2.9	2.3	2.5	2.5	2.7
Manipulatives for math	3.5	2.4	2.3	2.6	2.8	2.7
Numerical activities	4.5	3.6	3.4	3.4	3.8	3.7
Mathematical concept activities	3.9	2.8	2.6	3.0	3.0	3.0
Interactions	4.4	4.2	4.0	4.1	3.8	4.1
Use of discipline	4.5	4.7	4.3	4.5	4.1	4.4
Interaction with children	5.0	4.7	4.1	4.5	4.4	4.5
Child-child interactions	4.7	4.8	4.6	4.5	4.4	4.6
Use of free-choice time	4.1	3.0	3.1	3.6	3.5	3.4
Use of Group work	4.1	2.9	2.9	2.9	2.8	3.0

Engagement in lessons	4.2	4.2	4.0	4.0	3.7	4.0
Connects to life experiences	3.6	3.9	3.4	3.5	3.2	3.6
Engages boys & girls	4.8	4.6	4.9	4.7	4.0	4.6
Engages different learning ability	4.4	4.7	4.6	4.1	4.2	4.4
Child respect of others	4.2	4.7	4.3	4.5	4.0	4.4

	Kigali City	East	North	South	West
General Classroom Resources	3.43	3.08	2.45	3.09	2.90
Literacy & Numeracy Environment	3.83	3.07	2.90	2.98	3.08
Classroom Interactions	4.37	4.21	4.01	4.08	3.83
IDELA-CE Total	3.88	3.45	3.12	3.38	3.27

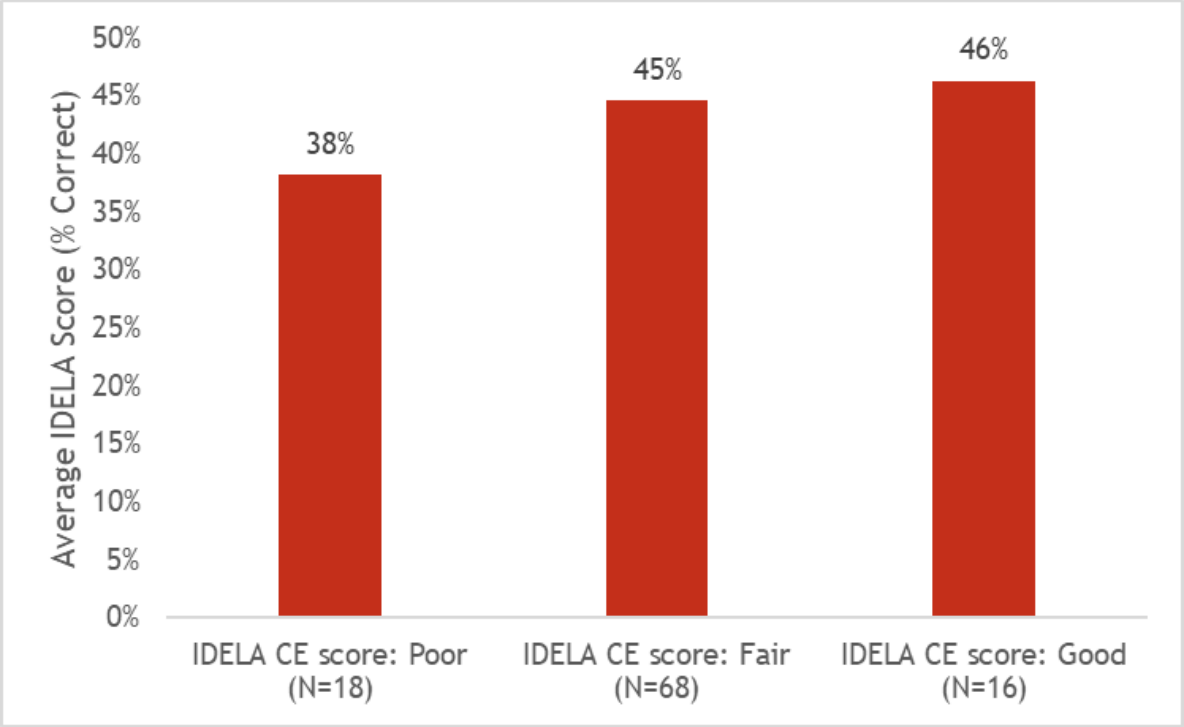
Figure 19. Proportion of classrooms by IDELA-CE Total score categories, by province



Higher quality classrooms were associated with the presence of more experienced teachers, longer length of support from a non-governmental organization, and presence of a nutrition program at the school (table A4). This suggests that classrooms and schools that have been receiving ongoing support from outside groups like NGOs, CSOs, or governmental partners in other sectors tend to have higher quality learning environments.

Higher quality classrooms (as measured by the IDELA-CE) were associated with stronger learning and development skills for children (figure 20 and table A4). Resources and teaching related to literacy and numeracy, as well as interactions between teachers and children explained more variance in children's skills than general classroom resources. The data suggest a larger gap between children's scores in classrooms rated as poor quality and those rated as fair, compared to the difference between those rated as fair and those rated as good quality (figure 20). This could be related to the IDELA-CE assessment happening mid-year; it's possible that there would be larger differences between categories if children had more time in the classrooms. Alternatively, poor ratings were generally related to unsafe classroom conditions (e.g., unhygienic latrines, trash or debris in classroom, broken windows, etc.), lack of learning materials, and negative or harsh teaching practices so it is reasonable that children in classrooms with these conditions struggle to learn, and possible that the difference between these conditions and a classroom with acceptable quality is greater than the difference between an acceptable classroom and a good quality classroom, with relation to children's learning outcomes. Possible implications could be to support all schools with "poor" ratings to raise them to "fair", with an ambition to progress and maintain all classrooms to "good".

Figure 20. Average IDELA child score by IDELA-CE category



Conclusion and Recommendations

i. Implications for schools & teachers

Only 3 percent of children in pre-primary were demonstrating mastery of the IDELA content at the time of the assessment, whereas 11 percent were struggling in acquiring this content (i.e., answering fewer than 1 out of 4 questions correctly). Given that most children accessing pre-primary education through the public system attend the government recommended one-year pre-primary education and in most cases with reduced teacher contact hours due to double shifting, there is need for a big and concerted effort to support more and more children to move towards IDELA content mastery. Having strong school readiness skills at the start of primary 1 increases the likelihood of children to succeed in the primary grades. For most children, support received only at school, while attending half a day and in the one year will not be enough to help them progress towards mastery and acquire foundational school readiness skills necessary to successfully transition from pre-primary to primary school, so it is recommended that effort be put into strengthening both school-based and home-based learning, including intentionally supporting parents to improve their knowledge, skills, capacity and motivation to start supporting children's learning at home even before they join the 1-year pre-primary schools and throughout the transition into the early grades.

There is need to increase equitable access to high quality pre-primary education in the whole country in order to ensure all children regardless of their socioeconomic and disability background have a strong foundation for learning. There are observable differences in terms of school readiness by province with children in Kigali showing the strongest skills while children in the Northern Province were struggling the

most. The trend is also similar when it comes to the quality of the learning environment (e.g, the Northern province also had more classrooms (29% in comparison to Kigali 8%) with a poor learning environment). Given the strong correlation between quality of classroom environments and children's school readiness skills, a targeted attention to improving the overall learning environment at school and in the classroom can go a long way in supporting children across the country. There are big differences between the quality of the classroom environment within the same province, so education officials need to use data for identifying the schools that need more support. Detailed school by school IDELA-CE data can be used to identify schools that need more support in terms of teacher capacity development including school-based coaching and mentoring on play-based teaching and learning pedagogy, classroom resourcing with books and other learning materials etc.

Teachers need further development on how to provide differentiated support to children since the data are showing that children come in with different levels of school readiness skills, including 20 percent or more who are struggling in 3 out of 4 IDELA domains (i.e. numeracy, literacy and social-emotional development). Within the given domains, children also struggle more with some tasks than others. For example, in social-emotional development children struggle more with emotional awareness and empathy than with self-awareness. Teacher capacity development needs to consider supporting teachers to acquire strategies and confidence in discovering these skills during everyday instruction and interactions with children, particularly for social-emotional development which is a relatively new domain of interest in pre-primary and early grades education. In addition, it is also important to build the capacity of teachers on disability and inclusion and how to apply inclusive education pedagogy to support children with disability as this was noted as one of the challenging and demotivating factors that teachers experience in their daily practice.

PPE and P1 teachers commonly reported feeling more stressed and having a higher temper since COVID-19 school closures. Despite this, most teachers report feeling prepared and motivated for the challenge of returning to the classroom. Teacher support interventions should leverage this motivation and interest in teaching while also making effort to remove or reduce stressors. The two key challenges faced by teachers in this study include dealing with students who come late to school and dealing with students who come to school with no materials. A strong community and home–school partnership is needed to remove these challenges, including in identifying ways of supporting families that are struggling to provide learning materials for their children. In addition, teachers also reported teaching in crowded classrooms and teaching with little or no textbooks as big challenges. Removing these challenges would go along to increase teacher well-being and satisfaction. Most importantly, it is recommended that REB consider intentionally introducing teacher emotional and psychological wellbeing strategies and activities at the school level. It can be as simple as institutionalizing psychosocial support groups for teachers and training school leaders on simple stress relief and stress management techniques that they can introduce at the school level, targeting all teachers. Psychosocial wellbeing can also be mainstreamed into national teacher training so that teachers benefit from skills and knowledge to apply to themselves as well as to their work with children.

This study shows that teachers motivated by interacting with children are supporting more learning in their classrooms. This has implications for teacher training and teacher recruitment. Teachers can have more enjoyable interactions with children if they understand how children learn and develop, and how to engage them in joyful, playful and rewarding ways. Teacher capacity development can help elevate this teacher knowledge especially for pre-primary where the majority of teachers in the classrooms have no formal training on how to teach young children. In terms of teacher recruitment, interest and motivation to interact

with children can be included in the teacher profile and among the soft skills sought from teachers of young children on top of the education background.

As noted above, classrooms with poor quality are not optimally supporting children's learning and development so emphasis should be put on getting the lowest quality classrooms up to "Fair", with an ambition of moving and maintaining all schools at "good". Linking data from classroom observations to timely actions that support teachers to improve their skills and practice will help improve the situation. This means deploying tools such as the IDELA-CE by education officials closest to the schools and the teachers, especially the school directors of studies, sector-based education inspectors, and school-based peer mentors. Data at the school and sector level can be collected periodically (e.g., every term) to track changes in the learning environments with an aim to provide targeted and differentiated support for the most struggling schools and sectors. It would be highly impactful if time is allocated to reviewing this data at different levels of the supervision and monitoring system. IDELA-CE dashboards can be used by education officials from the school to the district and national level(for example by REB and NESA) to make decisions on where effort and investment are needed and to identify and celebrate improvements. This data can feed into the comprehensive cluster and school based continuous professional development (CPD) program of REB elaborated in the 2017/18-2023/24 ESSP and annual CPD plans. As the quality of the classroom environment is not static, it will be critical to keep collecting, reviewing, and utilizing data for decision making periodically. Save the Children is committed to supporting the government especially REB, NCDA and NESA in strengthening the institutionalization of the tool and capacity building of key support staff including those managing back-end data analysis and updating of live IDELA CE dashboard collating and synthesizing data at different levels.

ii. Implications for communities and families

On average, 68 percent of families report losing income due to COVID-19. In addition, 41 percent of caregivers' report feeling nervous or stressed fairly or very often. The impact of COVID19 on families can not be underestimated and this data reflects a global trend where more people have slid back into poverty due to the pandemic. This means that, families may be struggling more than before to meet their children's basic needs including both nutrition and education needs (e.g., school materials). Government and partners can invest in child poverty or livelihoods interventions that alleviate the burden on families including through provision of school meals to ensure that all children have at least one proper meal at school. School feeding is known to improve school attendance, attention to learning in school and other factors associated with strong learning and development. In addition, school leaders can work with local leaders to identify families that can benefit from social protection services to buffer them from the impact of the loss of income during the pandemic, something most will still be recovering from even in 2022.

The study also highlights relatively low levels of play and learning in homes, and higher levels of harsh discipline. Taken together we're seeing that parents need more support in improving the home learning environment. The positive and evidence-based activities that support optimal learning, development in safe home environments don't require a lot of material or financial investment on the side of the parents as most are no cost activities such as singing, two-way communication, storytelling, playing, etc. Therefore, what parents and families need is exposure to new knowledge, improved capacity and support in adopting new practices, and attitudes via parenting education and parent support programs. National roll out of parenting education programs including the operationalization of the National Parenting Education Framework by NCDA can help improve the caregiver knowledge, attitudes and practices towards early childhood education and development.

On the side of Ministry of Education, strengthening the school – home and community collaboration for learning can expand the opportunities for children to learn beyond the school and classroom walls. This is particularly important since children have very limited contact time with teachers at school. Both Pre-primary and Primary 1 teachers reported having double shift classes which means that children have limited contact time in classrooms and with teachers per week. This is coupled with the large class sizes that teachers must deal with. This implies that children have more opportunity to learn outside the school at home and in community than at school. Out of school learning programs including reading clubs, maths camps, play groups and other such forms of out of school learning should be encouraged and should be linked to schools. Having oversight and support for out of school learning programs from schools and other education leaders including sector-based education inspections increases the sustainability and quality of such programs.

This study highlights the need to intentionally work on child protection. safety and security in the home environment. According to this study the children who experienced harsh discipline also had the lowest school readiness scores. This is not surprising since research shows that child abuse and maltreatment impair children's ability to learn. There is a need to support parents and other caregivers also transform their discipling practices including through addressing negative cultural beliefs around child discipling and providing alternative positive strategies. There also needs to be increased awareness of parents around what constitutes emotional and psychological safety for children including the need for building strong warm and loving relationships between children and parents. Other studies done by Save the Children and other agencies in Rwanda shows that this area is less understood by parents/caregivers. So, it is not surprising that young children also struggle in building strong social emotional foundations in areas such as emotional knowledge and empathy as noted above. This can also be improved through national roll out and operationalization of the National Parenting Education Framework by NCDA and partners.

As noted above, this study shows that children from most marginalized families are struggling the most so multisectoral collaboration and cross ministerial collaboration is needed to ensure that poorest families have holistic support to address their family needs including through access to social protection services, income generating activities, etc.

iii. Policy and advocacy

This study shows that remote lessons were highly effective. There is a need to put mechanisms in place to be able to deploy them again if needed. Ideally, remote learning mechanisms, most especially radio can be deployed as part of continuous support for learning at home and as part of a blended remote and face to face learning modality, even during times of calm. This can increase education systems' readiness and resilience to disruptions and emergencies while also expanding the opportunities for learning beyond the school and classrooms. For even greater success, there is need to conduct further analysis about which children access or don't access remote learning and how to generate new strategies for reaching all children. Investing in building strong and continuous remote learning resources and systems, well-integrated with regular face-to-face schooling, has a potential to improve learning outcomes in the interim while also ensuring that there are minimal disruptions in case schools have to suddenly close. The same remote learning platforms can also be used for teacher capacity development, community engagement and parental education, improving the overall ecosystem of support around children.

This study draws attention to the need for increased pre-primary education financing including towards supporting teacher salaries. Only 23% of pre-primary teachers in public schools in the country are currently on government payrolls in comparison to 100% of primary 1 teachers. This is a well-known challenge in terms of teacher retention, teacher motivation and the ability to attract and retain qualified pre-primary teachers especially given competition with better paying private pre-schools. Pre-primary teachers also handle slightly more children and have more overcrowding than the primary school teachers, which all acts to limit the quality of learning for students. As noted in the 2017/2018-2023/24 ESSP, the government of Rwanda's spending on education at 13.1% is below international standards and below recommend 15-20% share of the national budget and the share of the education budget allocated to pre-primary is way below the required levels to provide both access and quality education to pre-primary age children. Increasing the allocation of the pre-primary share of the overall education sector budget and possibly the share of education in the national budget can increase the resources allocated to supporting the newest sub sector within the basic education in Rwanda.

The study also highlights the fact that only 30 percent of teachers in pre-primary classrooms have been trained as a teacher. This, taken together with known statistics of how many trained pre-primary teachers the teacher training colleges produce per year, we can anticipate that this scenario will persist for the foreseeable future. This implies that the Ministry of Education and Rwanda Basic Education Board need to explore alternative professionalization and career pathways for these teachers in service so that they can attain formal education training while continuing to teach in schools. These alternative certification and qualification tracks can help improve the number of qualified staff in pre-primary classrooms while also meeting the huge and increasing demand for pre-primary services.

IV. Appendix A

Table A1. IDELA scores by Province and grade level, weighted standardized scores

VARIABLES	(1) Motor	(2) Literacy	(3) Numeracy	(4) Social-emotional	(5) Executive function	(6) Total IDELA
Kigali City	Reference	Reference	Reference	Reference	Reference	Reference
East Province	-0.218	-0.441***	-0.364**	-0.546***	-0.153	-0.457***
	(0.119)	(0.0806)	(0.121)	(0.139)	(0.0865)	(0.116)
North Province	-0.223	-0.439***	-0.460***	-0.780***	-0.398***	-0.551***
	(0.129)	(0.0829)	(0.121)	(0.138)	(0.0977)	(0.116)
South Province	-0.0121	-0.257**	-0.0973	-0.160	-0.167	-0.158
	(0.109)	(0.0864)	(0.128)	(0.139)	(0.0864)	(0.119)
West Province	-0.156	-0.339***	-0.203	-0.422**	-0.217**	-0.327**
	(0.114)	(0.0760)	(0.117)	(0.136)	(0.0778)	(0.111)
PPE	Reference	Reference	Reference	Reference	Reference	Reference
Primary 1	0.610***	0.926***	0.784***	0.291***	0.442***	0.766***
	(0.0641)	(0.0653)	(0.0571)	(0.0648)	(0.0655)	(0.0594)
Enrolled in 2020	0.266***	0.154***	0.131**	0.129*	0.178***	0.195***
	(0.0542)	(0.0444)	(0.0406)	(0.0622)	(0.0482)	(0.0491)
Child age (years)	0.250***	0.199***	0.261***	0.252***	0.195***	0.277***
	(0.0235)	(0.0163)	(0.0192)	(0.0207)	(0.0217)	(0.0165)
Child is female	-0.00444	-0.0129	-0.0120	-0.0195	0.0170	-0.0142
	(0.0433)	(0.0338)	(0.0374)	(0.0410)	(0.0454)	(0.0359)
Constant	-1.811***	-1.423***	-1.794***	-1.329***	-1.301***	-1.832***
	(0.173)	(0.110)	(0.138)	(0.157)	(0.129)	(0.135)
Observations	2,334	2,334	2,334	2,334	2,334	2,334
Number of groups	0.370	0.499	0.484	0.252	0.215	0.521
r2_a	0.368	0.497	0.482	0.250	0.212	0.519

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table A2. IDELA scores by access to remote classes during COVID-19, weighted standardized scores

VARIABLES	(1) Motor	(2) Literacy	(3) Numeracy	(4) Social-emotional	(5) Executive function	(6) Total IDELA
No remote classes	Reference	Reference	Reference	Reference	Reference	Reference
Followed remote classes	0.185***	0.274***	0.225***	0.130*	0.172**	0.238***
	(0.0450)	(0.0449)	(0.0431)	(0.0604)	(0.0533)	(0.0401)
Child attends PPE	Reference	Reference	Reference	Reference	Reference	Reference
Child attends P1	0.600***	0.903***	0.772***	0.286***	0.427***	0.751***
	(0.0663)	(0.0669)	(0.0594)	(0.0668)	(0.0680)	(0.0607)
Enrolled in 2020	Reference	Reference	Reference	Reference	Reference	Reference
Enrolled in 2021	0.262***	0.141***	0.127**	0.121*	0.169***	0.186***
	(0.0567)	(0.0418)	(0.0399)	(0.0567)	(0.0489)	(0.0476)
Child age (years)	0.248***	0.207***	0.262***	0.255***	0.204***	0.280***
	(0.0239)	(0.0165)	(0.0189)	(0.0208)	(0.0214)	(0.0166)
Child is female	-0.00870	-0.0176	-0.0158	-0.00646	0.00852	-0.0143
	(0.0421)	(0.0330)	(0.0374)	(0.0426)	(0.0460)	(0.0358)
Kigali City	Reference	Reference	Reference	Reference	Reference	Reference
East Province	-0.200	-0.379***	-0.310*	-0.506***	-0.132	-0.406***
	(0.120)	(0.0819)	(0.120)	(0.134)	(0.0879)	(0.114)
North Province	-0.183	-0.382***	-0.413***	-0.747***	-0.361***	-0.499***
	(0.129)	(0.0833)	(0.119)	(0.132)	(0.0955)	(0.113)
South Province	0.0347	-0.197*	-0.0437	-0.144	-0.115	-0.106
	(0.112)	(0.0873)	(0.129)	(0.134)	(0.0839)	(0.117)
West Province	-0.105	-0.263**	-0.140	-0.377**	-0.168*	-0.259*
	(0.114)	(0.0789)	(0.117)	(0.130)	(0.0768)	(0.109)
Constant	-1.865***	-1.548***	-1.881***	-1.402***	-1.402***	-1.932***
	(0.180)	(0.115)	(0.143)	(0.157)	(0.130)	(0.139)
Observations	2,261	2,261	2,261	2,261	2,261	2,261
R-squared	0.378	0.518	0.498	0.259	0.227	0.535
r2_a	0.375	0.516	0.496	0.256	0.224	0.533

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table A3. IDELA scores by access to remote classes during COVID-19 with equity covariates, weighted standardized scores

VARIABLES	1 Motor (Std)	2 Literacy (Std)	3 Numeracy (Std)	4 Social-emotional (Std)	5 Executive Function (Std)	6 IDELA (Std)
Followed remote lessons during COVID-19 closures	0.0890*	0.195***	0.115**	0.0140	0.110	0.121*
	(0.0414)	(0.0353)	(0.0359)	(0.0729)	(0.0622)	(0.0481)
Enrolled in PPE	Reference	Reference	Reference	Reference	Reference	Reference
Enrolled in Primary 1	0.584***	0.887***	0.773***	0.275***	0.445***	0.739***
	(0.0532)	(0.0688)	(0.0659)	(0.0578)	(0.0563)	(0.0627)
Enrolled in 2021	Reference	Reference	Reference	Reference	Reference	Reference
Enrolled in 2020	0.188**	0.123***	0.0640*	0.0753	0.124**	0.131***
	(0.0718)	(0.0229)	(0.0301)	(0.0533)	(0.0456)	(0.0329)
Total books and toys types at home	0.0299***	0.0174	0.0256	0.0341**	-0.0119	0.0304**
	(0.00749)	(0.0107)	(0.0146)	(0.0113)	(0.0101)	(0.0101)
Total home possessions	0.0243	0.0327**	0.0323***	0.0271**	0.0353***	0.0340***
	(0.0127)	(0.0109)	(0.00659)	(0.00882)	(0.0132)	(0.00913)
Total home learning activities	0.00125	0.0188**	0.0112	0.0176*	0.0239	0.0143*
	(0.00395)	(0.00723)	(0.0156)	(0.00789)	(0.0143)	(0.00637)
Total harsh discipline activities	-0.0536	-0.0358	-0.0397**	0.00578	-0.0255	-0.0359
	(0.0327)	(0.0237)	(0.0128)	(0.0126)	(0.0185)	(0.0219)
Child age (years)	0.256***	0.232***	0.277***	0.277***	0.208***	0.301***
	(0.0185)	(0.00666)	(0.0129)	(0.0153)	(0.0201)	(0.00616)
Child is female	-0.0151	-0.00175	-0.0195	-0.0208	-0.0217	-0.0157
	(0.0417)	(0.0551)	(0.0401)	(0.0458)	(0.0302)	(0.0503)
Constant	-2.102***	-2.187***	-2.341***	-2.187***	-1.740***	-2.547***
	(0.191)	(0.0849)	(0.105)	(0.116)	(0.0889)	-0.132
Observations	1,985	1,985	1,985	1,985	1,985	1,985

Table A4. Factors influencing classroom quality rating (IDELA-CE)

VARIABLES	(1) IDELA-CE Total
Kigali City	Reference
East Province	-0.389
	(0.253)
North Province	-0.691*
	(0.268)
South Province	-0.491*
	(0.208)
West Province	-0.556*
	(0.218)
Nutrition program present	0.331*
	(0.136)
Length of NGO support	0.136*
	(0.0537)
Teacher professional experience	0.330***
	(0.0791)
Constant	3.052***
	(0.265)
Observations	105
R-squared	0.297
r2_a	0.246

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table A5. IDELA-CE item-level results, by province

Item score range (1 – 5)	Kigali city	East	North	South	West	Total
Size of classroom	4.5	4.6	4.0	3.8	4.1	4.2
Arrangement of classroom	3.3	4.2	3.4	3.5	3.6	3.6
Cleanliness of classroom	4.5	4.0	3.7	4.0	3.4	3.9
Furniture	4.1	3.9	2.3	3.1	2.8	3.3
Learning areas: Space	3.2	2.6	2.0	2.3	2.2	2.4
Learning areas: Materials	3.2	2.2	1.9	2.1	2.2	2.2
Gross motor: Space	3.2	4.0	2.6	3.3	3.5	3.4
Gross motor: Materials	2.7	2.2	1.3	1.8	1.6	1.9
Toilet facilities	3.9	3.4	2.4	3.9	2.8	3.4
Handwashing facilities	3.2	3.1	2.4	3.8	3.1	3.2
Handwashing practices	3.2	2.6	2.1	3.6	3.2	3.0
Daily schedule content	3.5	2.0	1.7	2.4	2.2	2.3
Daily schedule teacher use	3.2	2.5	2.3	3.1	2.5	2.7
Daily schedule preparation	3.3	2.9	2.6	3.2	3.1	3.0
Daily routine content	3.3	2.4	2.1	2.6	2.9	2.6
Daily routine teacher use	3.0	2.6	2.3	2.8	2.6	2.7
Daily routine preparation	3.2	3.1	2.6	3.2	3.4	3.1
Print environment	3.6	2.5	2.6	2.4	2.4	2.6
Letter/word reading activities	4.1	3.7	3.6	3.2	3.1	3.5
Book environment	3.2	2.4	2.4	2.4	2.4	2.5
Book reading activities	3.9	3.4	3.0	3.1	3.4	3.3
Oral language use	3.9	3.7	3.7	3.8	3.9	3.8
Oral language improvement	4.2	3.2	3.1	3.5	3.5	3.5

Printed number environment	3.5	2.9	2.3	2.5	2.5	2.7
Manipulatives for math	3.5	2.4	2.3	2.6	2.8	2.7
Numerical activities	4.5	3.6	3.4	3.4	3.8	3.7
Mathematical concept activities	3.9	2.8	2.6	3.0	3.0	3.0
Use of discipline	4.5	4.7	4.3	4.5	4.1	4.4
Interaction with children	5.0	4.7	4.1	4.5	4.4	4.5
Child-child interactions	4.7	4.8	4.6	4.5	4.4	4.6
Use of free-choice time	4.1	3.0	3.1	3.6	3.5	3.4
Use of Group work	4.1	2.9	2.9	2.9	2.8	3.0
Engagement in lessons	4.2	4.2	4.0	4.0	3.7	4.0
Connects to life experiences	3.6	3.9	3.4	3.5	3.2	3.6
Engages boys & girls	4.8	4.6	4.9	4.7	4.0	4.6
Engages different learning ability	4.4	4.7	4.6	4.1	4.2	4.4
Child respect of others	4.2	4.7	4.3	4.5	4.0	4.4