Improving School Readiness through Early Childhood Development in Uganda: Baseline Report on the Aga Khan Foundation Uganda's Madrasa Early Childhood Program

AGA KHAN FOUNDATION
An agency of the Aga Khan Development Network

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Table of Contents

Lists of Graphs, Tables and Figures

List of Acronyms and Abbreviations

AKFU	Aga Khan Foundation Uganda
MECPU	Madrasa Early Childhood Program Uganda
ECD	Early Childhood Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
IECD	Integrated Early Childhood Development Policy
CEC	Certificate in Early Childhood Development
MECDI	Madrasa Early Childhood Development Institute
CMC	Center Management Committee
SMC	School Management Committee
PTA	Parent Teacher Association
WASH	Water, Sanitation and Hygiene
HT	Head Teacher
PLE	Primary Leaving Examinations
UCE	Uganda Certificate of Education
A Level	Advanced Level
NGO	Non-Government Organization
IDELA	International Development and Early Learning Assessment
ANOVA	Analysis of Variance
RCT	Randomized Control Trial
MOES	Ministry of Education and Sports

1 Introduction

International evidence is unanimous on the necessity for quality early childhood development and education services to achieve the full cognitive, educational, economic and social potential of children. Investment in high quality Early Childhood Development (ECD) provision is shown to bring greater return than at any other period in the education cycle.

The ELMA Foundation is supporting the Aga Khan Foundation Uganda (AKFU) to improve early childhood services in three districts in Uganda and to strengthen the role of district education officials to coordinate and monitor the delivery of early childhood services. AKFU, through its Madrasa Early Childhood Program Uganda (MECPU), has been delivering high quality ECD programs in Uganda for 23 years.

A key goal of the program is to demonstrate how to improve critical services for children through existing government and community structures. Central to this goal is evidence that the program has a positive impact on children's learning outcomes, caregivers' classroom practices and the learning environment. One of the overall objectives of the program is to strengthen the capacity of caregivers to support primary school readiness of children aged 3-5.

The evaluation will focus on outcomes associated with improving children's school readiness in ECD centers. The program will be implemented in 40 ECD centers across three districts in central Uganda – Kampala, Wakiso and Mukono. The baseline survey covers all 40 of these centers in addition to the 40 comparison schools that have been selected for the study because they are similar along several key dimensions. This evaluation reaches almost 1,500 children in the three districts.

The report is structured as follows:

- Sections 1 and 2 provide an introduction and background to the program and its context;
- Section 3 presents the evaluation design, data collection methods, and challenges and limitations of the study;
- Section 4 offers the results of the balance tests to determine the equivalency of the treatment and comparison groups across school infrastructure, children's learning outcomes, and teacher behaviors;
- Section 5 provides further analysis and explanation of the baseline data across other key metrics such as the district and geographic location of the schools;
- Section 6 closes the paper with a summary of key findings and conclusions; and
- The Appendix provides a guide to all of the documents used in the intervention as well as additional analysis tables broken down by gender, age, geographic location and treatment group that were not included in the main body of this report.

2 Background

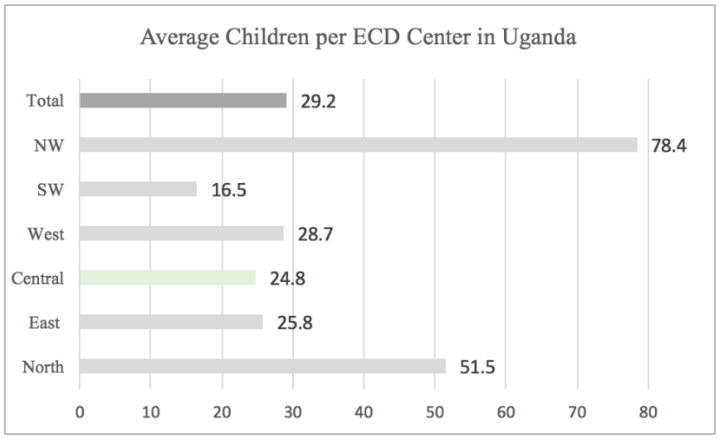
2.1 The ECD Policy Context in Uganda

The research on the importance of early childhood education is conclusive, and many governments are beginning to take note of this and mandate ECD for children in their country. According to research conducted by Cambridge Education from 2017-2018, up to 70% of Uganda's 3.6 million children between 3 and 5 years enter primary school unprepared to learn. Their research also found that poor teaching skills and a widespread lack of accountability is putting child development – and child safety – at risk. In Uganda, policy-makers are paying attention to this research and letting it guide their policy objectives. However, ECD is still not mandated in Uganda and there is no universal pre-primary education. Yet, many communities take initiative and have ECD centers of their own. This is evidenced by the dramatic increase in the number of pre-primary schools in the country, which increased 236% from 2007 to 2011 (Ejuu, 2012). The number of institutions that train caregivers in ECD has not kept pace with this, but also increased during this time by a milder 70%.

This evaluation is focused on the Central Region of Uganda. According to the Ministry of Education and Sports 2016 Statistical Abstract, there are 6,798 ECD centers in the country, with 35.1% of them (2,386 centers) in the Central Region. Of the total number of ECD centers countrywide, only 2,084 are licensed and 1,174 are registered; the remainder are neither and are technically operating without approval. This finding is in keeping with the recent Cambridge Education study, which found that 56% of 143 sampled ECD centers countrywide were neither licensed or registered; many of the centers in the study also failed to meet basic requirements or minimum standards according to government registration and licensing guidelines for private ECD centers.

A 2012 report sponsored by UNESCO on the status of implementing the ECD policy in Uganda found that the central region had 2,935 trained ECD caregivers for 2,860 registered schools. That amounts to about 1.02 trained caregivers per ECD center, compared to the national average of 1.15 per school. In the Central Region, these caregivers are responsible for 25 children on average. (Ejuu, 2012). This is below the national guideline of a maximum of 40 children per teacher in an ECD classroom. While the Central Region is second only to the Southwest in having the lowest average number of caregivers per school, these caregivers are responsible for fewer children on average than other regions; this is shown in Graph 1 below.

Graph 1: Average Enrolment per ECD Center in Uganda



One characteristic uniting all of the ECD centers in the country is the lack of teachers who are qualified to teach in ECD. In addition, enrollment in pre-primary is still low. Although enrollment in ECD centers has increased significantly in Uganda, it is still only 15 percent throughout the country according to a report produced by Cambridge Education for the July 2018 ECD Symposium. This lack of adequate investment in the pre-primary years leads to further disparities in education at the primary level. For those that do utilize ECD services in the Central Region, constraints at the ECD center, health center and at home result in poor learning outcomes and transition from ECD to primary. The state of primary education in Uganda gives cause

for concern: about 50 percent of those who remain in school do not reach expected levels of competency, especially in literacy and numeracy. Consequently, only 43 percent of children who complete primary will advance to the secondary level.

In 2016, the government launched the Integrated Early Childhood Development Policy (IECD Policy). The goal of this policy is to provide guidance and support to the actors working in ECD throughout the country; the ultimate aim of the policy is that children are supported in their holistic development starting from conception. In this plan, the government specifies the need to do the following:

1. Establish a division in charge of pre-primary education;
2. Properly supervise the quality of the existing ECD programs;
3. Enhance the professional development and support given to primary ECD providers; and
4. Create ECD centers at every primary school in the country and support those that are community based.

The intervention planned by AKFU is well-aligned with these stated policy objectives, particularly the second and third objectives. Given AKFU's familiarity with the Central Region, the proposed interventions will be implemented in three districts (Kampala, Wakiso and Mukono) where AKFU already has a strong presence and can deepen its work based on lessons learned in previous and existing interventions. The proposed intervention is aligned with each district's development plan. AKFU has experience in improving learning environments in ECD centers through teacher training, mentoring and encouraging parental involvement, which has proven to improve children's brain development and transition through school.

2.2 The Intervention

The intervention by Aga Khan Foundation Uganda in partnership with ELMA Philanthropies seeks to ***improve the wellbeing of boys and girls aged 0-8 in Kampala, Wakiso and Mukono Districts in Central Uganda.*** This is defined by the following key objectives:

- Objective 1: Improved care practices including cognitive stimulation and nutrition, among caregivers of boys and girls aged 0-3.
- Objective 2: Strengthened capacity of caregivers to support primary school readiness for boys and girls aged 3-5.
- Objective 3: Increased capacity of primary schools to support successful transition and retention of children aged 6-8.
- Objective 4: Strengthened government system for the delivery of ECD services at the district level.

The four key objectives will be accomplished through the following methods:

1. **Teacher Training:** AKFU is offering a two-year government recognized Certificate in Early Childhood Development (CEC) course (delivered through MECDI) for trainees who meet the minimum requirement as set out by Government of Uganda, and a one-year Child Care program for those without minimum qualifications. The training program includes the following:

    a. Face-to-face training: Occurs during holiday periods while mentor support is delivered at the school level during the school term. The course is offered in an in-service format and is catered to caregivers who work in community-based ECD centers but who lack formal training on ECD.
    b. Program Ownership: The tuition fee is covered 30% by the trainees and 70% by the intervention (with funding from AKFU and ELMA).
    c. Mentor Support: All course members receive classroom support for an ECD specialist.
    d. Appropriate Teaching Techniques: The course emphasizes the importance of play-based learning and facilitates access to a variety of learning experiences using materials available in the everyday environment. As a result, ECD caregivers will learn appropriate techniques and

skills to create locally-sourced, age-appropriate teaching and learning materials that support early language, numeracy, literacy and physical development, and catering to the psycho-emotional wellbeing of the children.

2. **Parental and Community Involvement:** AKFU will engage the community during biannual ECD stakeholders' workshops (with community members, religious leaders, local government officials and parents), parent teacher conferences, parent meetings and open days.

    a. *Promotion of Beneficial Practices:* The topics of these engagements will include age-appropriate school enrollment, children's rights, parental involvement in children's development and learning, and teachers' preparedness to receive children in a conducive learning environment.
    b. *Parental Engagement in Learning:* Parents will also assist ECD caregivers in developing learning aids and play materials using locally available materials for children attending the ECD centers.

3. **District Engagement:** To improve quality assurance and delivery of these interventions, AKFU will work within and build upon existing district education structures.

    a. *Capacity-building:* District officials will be called upon to provide assessment, mentorship and feedback on teaching and learning methodologies and the classroom environment in the 40 community based ECD centers targeted in the program.
    b. *Program Sustainability:* District officials will be engaged in co-training ECD teachers and jointly delivering classroom mentoring sessions to ensure they are prepared and committed to lead on continued implementation at the end of the project period.

By the end of the three years, the project will reach 59,280 children, 2,000 parents, 80 Caregivers, 40 ECD centers, 50 government officials, 60 Village Health Teams in 14 health centers, 28 health workers, 200 Center Management Committees (CMCs), 200 School Management Committees (SMCs), 200 Parent Teacher Associations (PTAs), 240 lower primary school teachers in 80 schools, and 80 primary school head teachers through a tailored package of capacity building courses and training and mentorship support.

This baseline evaluation focuses on Objective 2 of the AKFU intervention that seeks to strengthen the capacity of teachers to support primary school readiness for children ages 3 to 5. This outcome is motivated in particular by the need to legitimize the ECD teacher profession in Uganda. Therefore, the evaluation will have a particular focus on teachers and how they may have improved due to the trainings and support provided by AKFU. This is outlined in the Teacher Training sections 1a through 1d above.

In order to analyze this, data is collected on the teacher's observed behaviors in the classroom, background qualifications, and their attitudes and opinions around ECD. The final marker of a successful intervention targeting teachers is its ultimate effect on the children being taught. Children are therefore a key focus of this evaluation. Information on their school readiness versus a comparison group of children will inform whether or not this intervention was definitively a success.

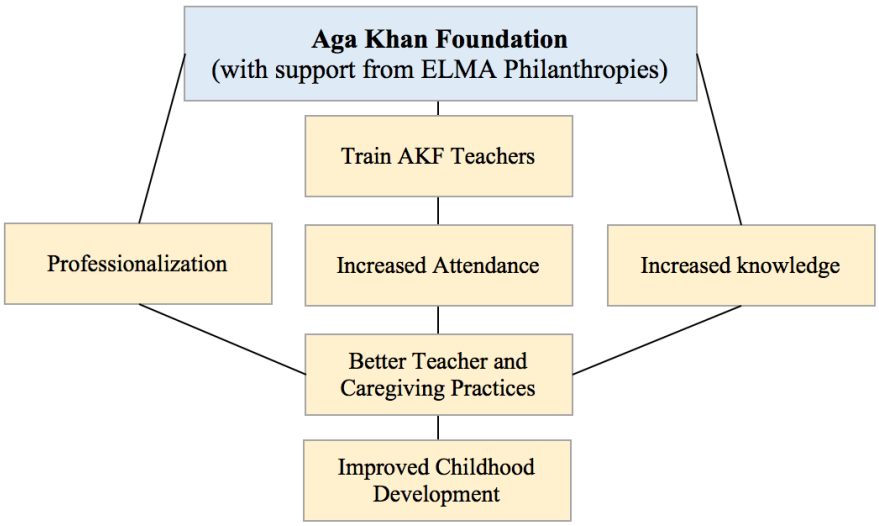
2.3 Theory of Change

The theory of change for Objective 2 of the intervention, mapped by Ichuli based on AKF's program design, is outlined in Figure 1 below. The hypothesis central to this theory of change is that children's development outcomes are low because teachers have not been given the training and tools that they need to succeed in Early Childhood Development. Hence, they are ill-equipped to handle the demands placed on them and cannot adequately support the needs of their learners.

Therefore, change can be enabled by training these teachers and giving them the support that they need in order to succeed. A teacher who is trained by the program may improve their attendance, feel legitimized and

have increased knowledge about ECD. These benefits could then lead to better teacher practices and behaviors in the classroom. Finally, if the hypothesis is correct, this will lead to improved development outcomes for the children in the care of these teachers.

Figure 1: Theory of Change for Objective #2



3 Evaluation

3.1 Study Design

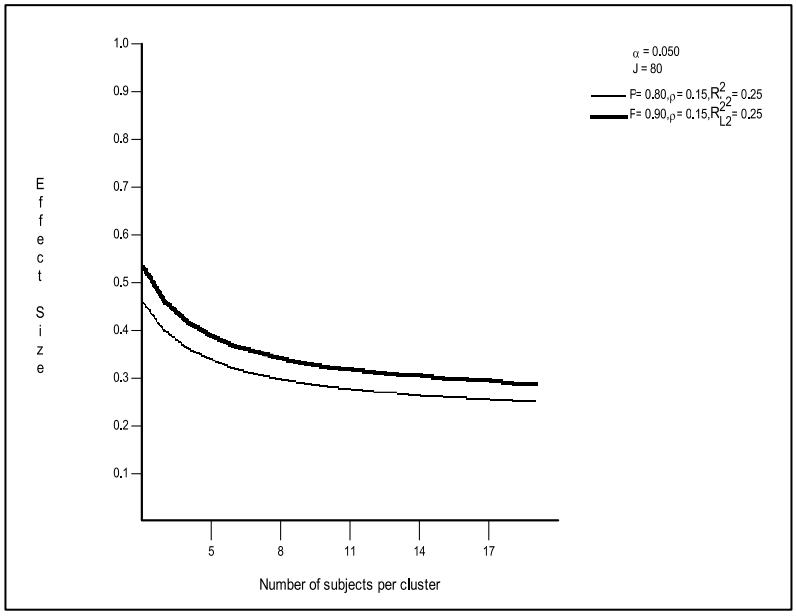
The study design used in this baseline evaluation is quasi-experimental. Treatment schools were selected by AKFU and a technique known as Propensity Score Matching was used to match comparison schools to these treatment schools using observable measures and available data for both treatment and potential comparison schools. This section describes in detail the methods that were used to select these schools and also how teachers and children were sampled.

3.1.1 Power Calculations

Using a power calculation, we determined the number of ECD centers and children per center that were needed to sample in order to get statistical significance from the survey results. Power goes on a scale of 0 to 1, with 1 meaning the highest likelihood of getting significance and ideally anything between .7 and above being acceptable. In doing this we determined that we need to select 80 ECD centers in total to gain this level of confidence. We divided them as such: 40 AKF supported ECD centers and 40 comparison ECD centers run by other non-governmental or private organizations.

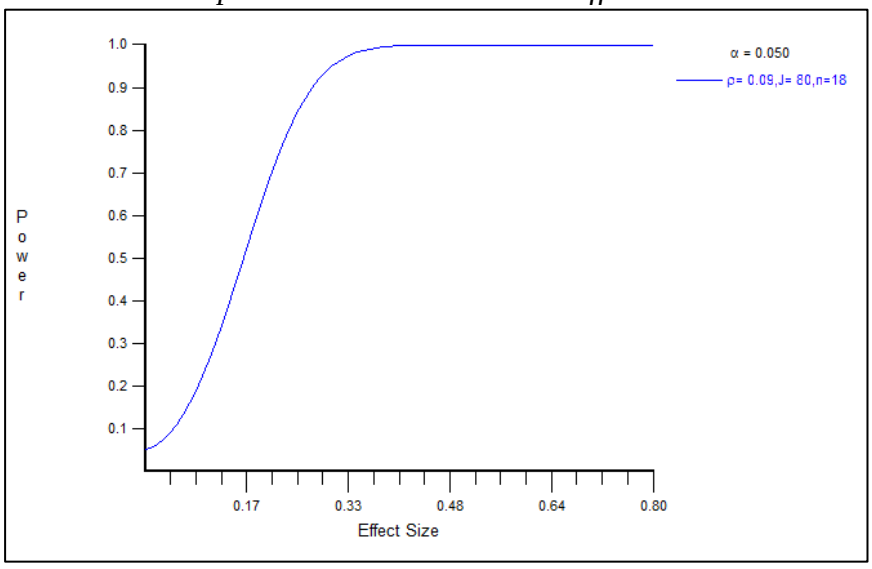
We also collected information on additional co-variates in order to increase the power at the completion of the survey. Examples of these covariates include children's ages and gender. Graph 2 shows that at least 10-15 children per center must be assessed in order to prove results from the intervention.

Graph 2: Power Calculations and Sample Size



Using the intraclass correlation coefficient from the baseline IDELA data for the children, it was determined that 0.25 standard deviations is the minimum detectable effect size. The graph below illustrates this.

Graph 3: Minimum Detectable Effect Size



3.1.2 School Sampling

All 40 treatment schools were included in the baseline. Treatment schools were hand-picked by the district local government in each target district against a set of criteria identified by AKF along several observable measures including, but not limited to, the below characteristics. Other characteristics such as a cooperative attitude of the school administration were also taken into consideration.

- Should be a government/public primary school for target primary schools and should be a community based ECD centers for the target nursery school.
- Should have equitable representation of religious denominations (Protestant, Catholic and Muslim).
- Close to a government health center 3 or 4.
- At least equitable representation of the sub-counties in each target district.
- The ECD and the primary school should be near each other, i.e. the primary school should be where the majority of children transition into upon completing their program at the ECD center.

In an effort to mitigate this inherent bias, we implemented a quasi-experimental technique known as propensity score matching (PSM) that has been developed from the statistical literature and is commonly used in program evaluation. This method is used to assign comparison schools to a known group of treatment schools in evaluations in which it is not feasible or desired to randomly assign schools to a treatment or control group. Information was collected on a total of 167 possible comparison schools across the three districts. This broke down to 61 possible comparison schools in Mukono, 88 in Wakiso, and 18 in Kampala. In Mukono and Wakiso, 30 comparison schools in total were selected, 15 in each district. In Kampala 10 comparison schools were selected.

These matches are done on the basis of observable characteristics about both groups. In this case, the matching characteristics were total enrollment of children in the school and the school type, ECD only or ECD and primary, and this created a fairly even distribution across the key variables. These variables were selected from the following list that was collected for each school at baseline (teacher enrollment and gender breakdown, children enrollment and gender breakdown, school type [ECD only or ECD primary], building type and ownership). Because of the relatively small number of potential comparison schools and the high amount of variation between these schools, the number of matching criteria that could be chosen was limited. This method does not therefore attempt to make the assumption that the selected comparison schools are exactly the same across observables and un-observables. Such a strong assumption is not possible unless the evaluation is an RCT. Rather, this is a quasi-experimental technique and we expect that there may be differences at the baseline. Because of this, in addition to matching, we also control for any differences that were statistically significantly different at baseline. At the time of collection, comparison schools had an average enrollment of 73.2 children and treatment schools had an average enrollment of 73.13 children.

1. *Treatment* (40 schools) – Schools to receive the AKF intervention from 2018-2019
2. *Comparison* (40 schools) – Schools selected as comparisons for the evaluation from 2018-2019

Replacement Schools

It was not possible to survey all of the original 40 schools that were selected. During the execution of the survey in the time between site selection, confirmation and survey activities, four of the 20 selected comparison schools were closed by the district due to non-compliance with the government's basic requirements and minimum standards for ECD centers. Unfortunately, notification of these closures was not communicated to Ichuli and was only discovered on the day the survey team visited the school. As quickly as possible we identified four potential replacement comparison schools using the same Propensity Score Matching technique that had been used to select the original four. These schools were contacted immediately and we attempted to schedule visits to the schools before the close of the term.

By the time they were replaced in the sample (e.g. the next week), the head teachers in the four replacement schools had closed the schools for the term and sent the children home. These closures were done two weeks before the official end of term, so although there were days remaining for the visits according to the official calendar, no children were on site at the schools. This led to a delay in assessments for those four schools until Term 2. The 4 replacement control schools were visited the second week of Term 2 once children had returned to classes. Enumerator teams confirmed with head teachers before and during the visits that no instruction had yet occurred in the schools – they were closed in Term 1 when the visits were originally attempted and there was no instruction in any of the schools in week 1 of Term 2. Children were just returning to school by the middle of week two of Term 2 when the survey team went to conduct the assessments.

That being said, the analysis presented in the baseline equivalency section does show that across every domain, children in the replacement schools scored slightly higher than the children that were tested in Term 1. This is not due to exposure to instruction in schools (as there was no formal instruction provided to these children at the ECD center during the time period in question). Rather, higher scores could be the result of general growth and development amongst this sample of children over the 6-week period between assessments. This

is discussed in great detail in the baseline equivalency section along with an explanation on what will be done at endline to ensure that these differences at baseline do not affect the final data analysis.

3.1.3 Sampling of Teachers

The original teacher sampling strategy was to observe a classroom lesson for one teacher from Baby class and one teacher from Middle class and then interview these same teachers. Therefore, the ideal number of teachers targeted in the survey was originally 160 for both the interview and the observation. Given the lack of middle class in 11 schools (3 treatment and 8 comparison) and teacher absenteeism in some schools on the day of the survey, the projected number for the teacher sample fell below that target. In total, 136 teachers were interviewed and 123 were observed. Because the children in ECD go home early, the pupil assessments were given the greatest priority. During the survey, there were times in which the children went home after the pupil assessments and classroom observations could not be conducted. Thus, the number of classroom observations is less than the total number of interviews. The breakdown of the teacher sample and the data collected on each teacher is detailed in Table 1 below.

Table 1: Teacher Participation in Survey

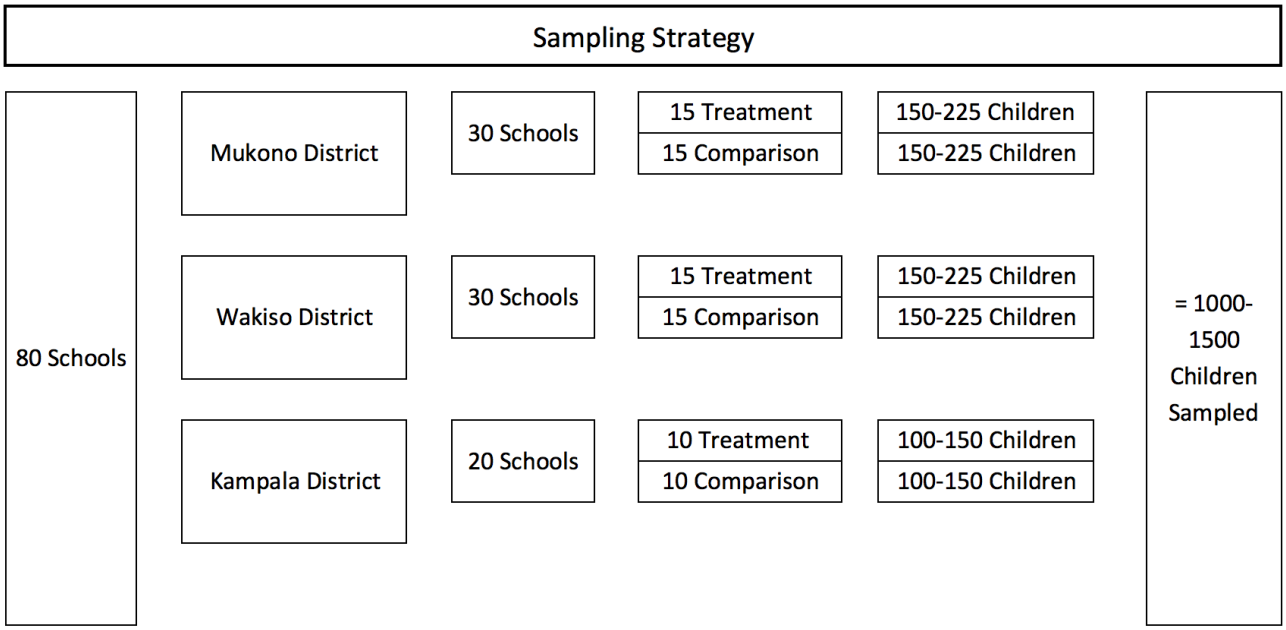
	Treatment		**Comparison**		**Total**
	Males	Females	Males	Females	
Teacher Interview	2	72	1	61	136
Classroom Observation	1	66	2	54	123
Total	3	133	3	115	

There were 11 fewer classroom observations done in comparison schools. Namely this occurs in the Middle class, where comparison schools had 10 fewer observations than in treatment schools. In Baby class the number of observations is only less by 1 in comparison schools. This is due in part to the combining of classes at the school level, which is a decision taken on a case-by-case basis by the school administration.

3.1.4 Sampling of Children

Figure 2 shows the original strategy for sampling children for this evaluation. The total number of children sampled is 1,436, which is on the upper end of the predicted range.

Figure 2: Sampling Strategy



There were some differences in the expected numbers across districts as seen in Table 2 below. It was predicted we would get 300 to 450 children in both Mukono and Wakiso Districts and 200 to 300 children in

Kampala District for a total of 1000 to 1500 children sampled. The predicted numbers were based upon Term 3 2017 enrollment data provided to Ichuli by the District Education Offices during the selection of comparison schools. Due to differences in enrollment during Term 1 2018, the districts of Mukono and Wakiso had a larger sample population than that of Kampala. There are also differences in the size of the sample population across comparison and treatment in each district, with Kampala having the most equitable distribution between treatment arms. Overall however, the total sample population is very close between comparison and treatment schools with only a difference of 20 additional children in treatment schools.

Table 2: Number of Children Sampled in Districts

	Comparison	Treatment	Total
Kampala	191	196	387
Mukono	329	286	615
Wakiso	188	246	434
Total	708	728	1,436

Survey participants were randomly selected from each of the ECD centers included in the study. Children in Middle class (with an average age of 4-5 years) were specifically targeted in each center as they are positioned to graduate from ECD to primary school by the close of the study. Wherever possible, they were randomly selected using a sampling interval by grouping pupils by age and gender and lining them up by height, counting off the sampling interval, and selecting every n^{th} pupil for testing. In this way, an equal number of children in each class (and age group) were selected, as well as an equal number of boys and girls in each class. The goal was that at least 20 children would be sampled from the Middle class at each center. However, it was not always possible to follow this procedure when the school enrollment was low. Many schools did not have 20 children enrolled in Middle class, and in fact, many schools did not have 20 children present across all classes (Baby, Middle or Top class) on the day of the survey when all of the classes were combined.

The low enrollment in these schools meant that we could not be as selective as we originally intended on who we took into the sample. This limitation necessitated that children be sampled from both Baby class and Middle class, and even then there were cases in which the desired sample size per school was not reached. If we had restricted the sampled to only Middle class, the sample numbers would have been too low for significant analysis. Out of the 76 schools visited in Term 1, 10 schools (13.2%) did not have a Middle class section (3 AKF, 7 Comparison). In these cases, children were sampled based upon age to capture as many 4 and 5-year-old children as possible in the sample.

Another point of note is that in some schools, Baby and Middle classes were combined. Enumerators were instructed to sample children aged 4 and 5 years old as the primary group, and to include 3-year olds only when the sample of 4 and 5 year olds on the day of the visit was not large enough; this was slightly more common in Comparison schools. In some cases, a handful of older learners (e.g. 6 and 7 year olds) attending the ECD were taken into the sample in order to reach the desired sample size based on the children in school on the day of the visit; this was slightly more common in AKF schools.

There were also cases in which data was unintentionally collected for 2 year olds. In this case, ages were incorrectly told to the enumerators by the teacher (e.g. they were identified as older than they were). Upon closer examination and the commencement of discussion and testing of the child, their age was confirmed by the head teacher and they were excluded from the sample (and thus the analysis).

Tables 3 and 4 below explain the sampling of children from Baby and Middle class across all schools, both AKF and Comparison, by district. They detail the breakdown of sampled learners by grade/class, age and type of school.

Table 3: Sample Breakdown by District, Grade, Gender and Treatment vs Comparison

District		Treatment (AKF)		Comparison	
	Grade/Class	Boys	Girls	Boys	Girls
Kampala	Baby	49	49	49	48
	Middle	49	49	47	48
	Total	**98**	**98**	**96**	**96**
Mukono	Baby	75	69	112	104
	Middle	68	74	63	54
	Total	**143**	**143**	**175**	**158**
Wakiso	Baby	85	62	56	59
	Middle	55	49	37	37
	Total	**140**	**111**	**93**	**96**
Overall	**Total**	**381**	**352**	**364**	**350**

****This summary includes 2-year old children (11 in number) who got sampled.*

Table 4: Sample Breakdown by Class, Age, Gender and Treatment vs Comparison

Grade/Class	Age	Treatment (AKF)		Total Treatment	Comparison		Total Comp.
	Age	Boys	Girls	Total	Boys	Girls	Total
Baby Class	2	4	0	4	2	1	3
	3	65	66	131	82	98	180
	4	96	83	179	93	69	162
	5	40	25	65	32	37	69
	6	3	4	7	8	5	13
	7	1	2	3	0	1	1
	Total	209	180	389	217	211	428
Middle Class	2	1	0	1	2	1	3
	3	1	1	2	6	7	13
	4	55	69	124	64	60	124
	5	91	86	177	56	65	121
	6	17	13	30	15	5	20
	7	7	3	10	4	1	5
	Total	172	172	344	147	139	286
Overall	**Total**	**381**	**352**	**733**	**364**	**350**	**714**

****This includes 2-year old children (11 children) who were sampled but whose data is not analyzed with the group.*

3.1.5 Estimated Attrition at Follow-Up

According to AKF, attrition has been difficult to establish in ECD centers as some children may temporarily stay out of school in a given term and then return again the next term or year. Other children are considered drop-outs even if they have only changed residence and joined another ECD center. According to AKF, on average five children drop out per year per ECD center; with an annual average enrolment of 7,900 children in AKF's 94 schools, the average attrition rate is 6%. We take that average and apply it to our survey participant population and assume the possibility of a 6-10% attrition rate for all pupils selected for the study. Given this range, we predict that there will be between 86 and 143 children who leave the sample between the baseline and endline evaluation.

Because we are in the upper range of the sample size needed to achieve power, the study population can cater for this projected attrition before the endline and still prove impact. Because there will be no midline evaluation it may be important to follow-up with these children at the halfway point to reduce the likelihood of attrition. This can be done by collecting and confirming information that can be used to track the children and mobilize them adequately for the endline evaluation. The possibility of utilizing this measure will be discussed with AKF. In addition, we will also be monitoring differential attrition across comparison and treatment schools at endline to ensure that children are not leaving the sample for reasons that are connected to their treatment assignment. This will help to mitigate the potential bias that could result from differential attrition.

3.2 Introduction to Baseline Equivalency

In general, a baseline that was successfully done shows that the treatment and comparison groups are equivalent across observable measures, i.e. there is no statistical difference between the two groups. This is known as baseline equivalency. A baseline that is biased will show that there are statistically different outcomes between treatment arms even prior to any intervention taking place in the schools. The golden standard for many evaluations is the Randomized Control Trial (RCT). In this evaluation method, schools are randomly assigned to either the treatment or control arm so that you can assume that schools are the same across both observable and unobservable characteristics.

However, the stringent requirements necessary to implement an RCT does not always match the needs of the organization implementing the intervention. In this case, schools could not be randomly assigned to treatment arms and therefore quasi-experimental methods were used instead. The method employed in this baseline was the Propensity Score Matching technique in which comparison schools were selected by a statistical program using several key measures in which we had data for both groups.

We employ these same baseline equivalency techniques that are used in RCTs in this evaluation although this is not a randomized evaluation. Data analysis is primarily presented in regression format in which treatment and comparison means are presented side-by-side in order to clearly indicate if the difference between the treatment and comparison schools on any specific measure is significant. This is done for the IDELA scores, school facilities, teacher interviews and teacher observations. This method allows us to know more about the baseline sample and whether or not the initial assignment of comparison schools to treatment schools was clean. Following the convention of social science literature, stars are used to indicate significance. Throughout this report, we will use 1 star to indicate a significance of 10% (p-value = .1), 2 stars for 5% (p-value = .05), and 3 stars for 1% (p-value = .01). A p-value of .1 or 10% means that there is a 10% chance that the difference between the two treatment arms is due to random chance. Therefore, a smaller p-value (larger number of stars) means that it is more likely that we can say that the difference between treatment and comparison is *not* due to random chance, but rather to some inherent difference between the two.

The main questions that frame this evaluation are the following:

1. What is the impact of MECPU's activities on children's school readiness, compared to children who are in non-MECPU ECD settings?
2. What are the teacher practices in centers in which MECPU works, and how do they compare to those in non-MECPU ECD settings?
3. What is the learning environment in centers in which MECPU works, and how do they compare to those in non-MECPU ECD settings?
4. What are the associations between ECD teacher practices and children's school readiness?

3.2.1 Report Format

This report format was modified from the original outline that was agreed upon with the client. This format was selected after doing a literature review of baseline reports that employ randomized methods and are

centered around Early Childhood Education. Namely these reports have been done in developing country contexts. We consulted most heavily the reports from ECD studies that were done in Ghana.

The two primary reports from Ghana that we modelled this paper off of are the following: *Improving early childhood development in rural Ghana through scalable low-cost community-run play schemes: Baseline report* done by Innovations for Poverty Action (IPA) and sponsored by the Economic and Social Research Council (ESRC) and *Testing and Scaling-up Supply- and Demand-side Interventions to Improve Kindergarten Educational Quality in Ghana: SIEF Baseline Validation Report***,** led by Dr. Sharon Wolf in coordination with Global TIES for Children, New York University, IPA and others. Wolf is a leader in ECD research and has collaborated with Save the Children to assess the construct validity of the IDELA assessment, therefore we could not find a more appropriate model for this paper.

3.3 Enumerator Selection, Training and Quality Assurance

Child assessments such as those used in this evaluation both require the selection and training of competent and reliable enumerators as well as extensive quality assurance to ensure interrater reliability in their performance during assessments. We followed guidelines and recommendations created by the IDELA team at Save the Children to ensure a high standard of reliability in the assessments conducted as well as ensure compliance with international standards for enumerator selection and training in child assessments. This section describes these processes in detail.

Ichuli utilized its database of competent enumerators with extensive experience in child and school-based assessments to identify a team of enumerators for the baseline survey. We have worked with these enumerators on various evaluations since 2014; they also participate in similar assessments conducted by Research Triangle Institute and USAID. Enumerators all had the following minimum qualifications:

1. A diploma or degree holder;
2. Fluent in the language of the children tested (Luganda);
3. Enjoys working with children and has the ability to build rapport;
4. Patient with children;
5. Able to complete the entire commitment, including training and data collection; and
6. Experience in past similar assessments with children, teachers and schools.

Based on these criteria, a total of 53 enumerators were recruited for training, and of those, 45 were selected based on their performance and interrater reliability to participate in the baseline. The training had four key objectives:

1. Enumerators will become familiar with basic school readiness and assessment concepts.
2. Enumerators will be able to build rapport with children and their caregivers.
3. Enumerators will be able to administer IDELA with confidence and accuracy.
4. Enumerators will be able to follow data collection plans as expected (both pilot and research).

The training was conducted over five days and included extensive time to become familiar with the assessment and practice conducting it in both training and school environments. A total of two practical exercises were carried out in actual ECD centers on days 3 and 4 of the training to ensure enumerators had significant field practice prior to the assessment.

Throughout the training, feedback was provided to enumerators on their performance. Feedback is a way of mentoring enumerators as well as ensuring that they are learning the right way to administer specific items. Attention was paid to individual enumerators throughout the training by the three master trainers from Ichuli during practice and field testing to offer this continuous support. Feedback on specific item administration, scoring and rapport building were provided in a group setting (during practice sessions and via debriefs after

field testing) as well in pairs and individually. During field testing, Ichuli's trainers were present to observe, correct issues and offer support.

In order to assure the quality of the enumerators selected for the actual baseline, Ichuli hired more enumerators for the training than were needed for the survey so that those who did not qualify were not selected. We informed the enumerators that there would be limited spots to motivate high performance during the training. Ongoing testing of enumerator performance was conducted throughout the week, including a final test to qualify enumerators and ensure high performance. Group, pair and individual scoring practice was conducted throughout the training week to ensure interrater reliability, and the final group of enumerators were selected based on performance scores.

3.4 Limitations of Survey Design

The limitations of this baseline survey fall into three main categories:

1. This is not a randomized evaluation and treatment schools were hand-picked by district local governments against criteria they set with AKFU.
2. A selection of teachers was trained by AKFU prior to the baseline.
3. The evaluation is meant to measure the final outcomes of the teacher training and improved classroom practices aspects of the intervention that lead to improved school readiness amongst children. However, this intervention is multi-faceted, involving parent and community engagement, local government engagement, and health initiatives; as a result, it will be impossible to truly disentangle which aspects of the intervention specifically led to which outcomes because in-depth data is only being collected regarding Objective 2.

Quasi-Experimental Study

As discussed in the survey design section, this evaluation employs quasi-experimental methods. Instead of every school getting an equal opportunity to be randomly assigned to treatment or comparison school status, the treatment schools were hand-picked by District Local Governments with the support of AKFU. By using Propensity Score Matching to assign comparison schools, we have attempted an alternative measure to produce a clean baseline. For the sake of transparency, we show p-values and statistical significance information from baseline on every relevant indicator that was used in data collection. This allows us to mimic the methods of randomized control trials and produce greater validity.

Teachers Trained Prior to Baseline

Teachers were trained in January 2018 prior to the beginning of the term and of the baseline collection phase. Unfortunately, this means that we are unable to ascertain what impact that training had on the teachers and the administration at the school. We do not know with certainty which differences were present between the treatment and comparison teachers prior to this training and which arose as a direct result of this training. We will attempt to disentangle this in the evaluation by analyzing the teacher interviews and classroom observations, which will help us understand whether teachers were trained or supported by other programs before or during the AKFU intervention or by AKFU themselves. AKFU provided details on the training package received by teachers during the school holiday before the start of the intervention in schools in Term 1 2018; this information is included in the teacher baseline equivalency section of this report.

Scope of the Evaluation

The scope of this evaluation is such that it is only designed to measure Objective 2 (Strengthened capacity of caregivers to support primary school readiness for boys and girls aged 3-5.); yet, teachers are not the only actors in the ECD space that are receiving support from the AKFU intervention. In fact, this is a four-pronged intervention meant to cover the communities, parents, districts, primary schools and ECD teachers.

Therefore, while this evaluation will be able to thoroughly present the final outcomes in children's school readiness scores, it will be fairly limited in its ability to disentangle which aspects of the intervention in particular caused any endline changes in the performance of the children. For example, PTAs and SMCs are being involved in this process, but during the design of the evaluation the focus was directed only towards teachers, classrooms and children due to decisions made by AKFU and the evaluation funder; as such, we did not interview them. In addition, parent and community-level engagement is another crucial part of the AKFU intervention, but they were not included as units of analysis in this evaluation.

That being said, we will be able to gather further data from teachers at the endline and get their opinions on what aspects of the program worked and what did not. This will not necessarily inform our understanding of the pathways to better quality ECD service delivery, but we will have a better understanding of how the program was perceived by its beneficiaries and what inputs they believe led to the most critical outcomes regarding child development and school readiness.

3.4 Evaluation Outcomes and Instruments

The evaluation outcomes that we will be studying in this evaluation are determined by the program's theory of change. The key units of analysis that will be studied are as follows:

1. *Children* are the most important unit of analysis in determining the success of this intervention. Children who were enrolled and present in a treatment or comparison ECD center on the day of the data collection team's visit were eligible for selection into the survey.

2. *Teachers* are a critical unit of analysis to understand how the intervention is operating. In order to be eligible for participation in the survey, the teacher must currently be enrolled as a teacher in a treatment or comparison school and have been present on the day the data collection team visited the school.

3. *School Facilities* are also studied as they relate to the overall learning environment in treatment and comparison schools. The condition of the facilities is measured through a School Checklist tool.

Table 5 below lays out the tools that were used throughout the baseline evaluation of the program.

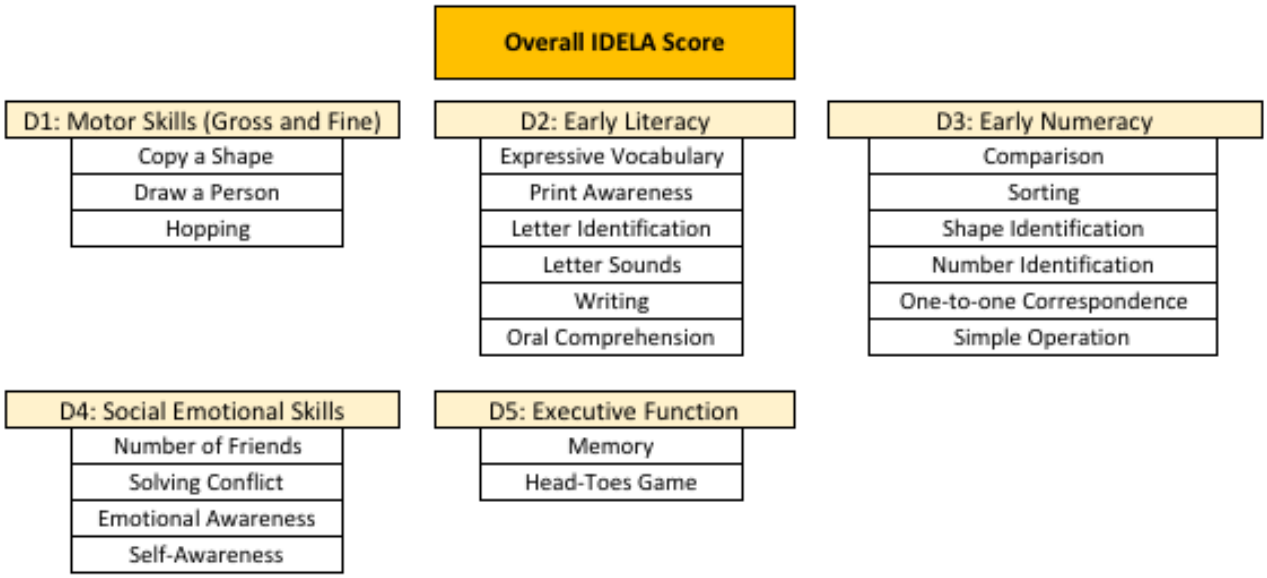
Table 5: Baseline Survey Tools and Participants

Target Group	Tools	Description of Tool
School Administration	School Checklist	• Provides an analysis of the overall learning environment in the school. It details information about the available physical infrastructure including WASH information, play and resource center existence and condition and classroom construction and composition. • In addition, information about management policies, available learning materials, and basic enrolment and attendance is also captured by the tool.
Teachers	Teacher Interview	• This tool serves to gather background and attitudinal information about the teachers. The background section consists of educational level information and years of experience in the classroom. • Data is collected on the financial and management support that teachers receive. • Teacher opinions and beliefs regarding early child development are captured by the tool. • This tool borrowed components from other major internationally tested tools such as the Measuring Early Learning Quality and Outcomes (MELQO) initiative, led by ECD experts at UNESCO,

		the World Bank, the Center for Universal Education at the Brookings Institution and UNICEF.
	Classroom Observation	• This tool primarily serves to give an objective list of the positive and negative practices exhibited by ECD teachers in a typical lesson. • The learning environment as a whole is also taken into consideration and information is gathered on the safety and quality of the classroom infrastructure. • This tool borrowed components from other major internationally tested tools such as the MELQO.
Children	Child Direct Assessment Tool (IDELA)	• The International Development and Early Learning Assessment (IDELA) tool is a direct assessment of a child's ability to perform certain tasks that are internationally recognized as benchmarks for a child's school readiness. It was developed by Save the Children and has been used globally to assess children's school readiness in key domains. The tool was selected for use in the evaluation as it represents key components of school readiness that have been agreed upon by experts as representative of the skills children need in order to succeed in primary school. • This tool is an adapted version of the IDELA with some slight modifications to the sub-tasks. These changes were agreed upon with the client after pre-testing of the tool. • This tool was administered in the first language of the children in the ECD centers, Luganda. When a child did not speak Luganda as their first language, English was used instead.

Figure 3 below illustrates how the IDELA score is calculated by averaging the five domains of motor skills, early literacy, early numeracy, social emotional skills and executive function. These domains are composed of 21 different sub-tasks. The overall domain score is calculated by taking the average of the sub-tasks relevant to each domain.

Figure 3: Breakdown of the IDELA Score



3.4.1 Monitoring Data

Ichuli will not collect monitoring data for the program. We will coordinate data collection on child and teacher enrollment in schools with AKFU in order to track the sample identified and tested in the baseline survey.

3.4.2 Timeline of Data Collection

The timeline below indicates when survey activities were executed during the baseline.[1]

[1] It is important to note that AKF-supported schools were initially selected in Mukono and Wakiso Districts prior to the start of the survey. However, some schools were replaced in the treatment group by AKF and the district administration in the weeks following the selection. Ichuli had to postpone the baseline until the final list of treatment schools was confirmed by AKF and the districts prior to the selection of comparison schools, which delayed the start of the survey until later in Term 1. KCCA did not sign the MOU until the beginning of April, so school selection could not begin at the same time in Kampala District, leading to further delays. Additionally, even after this the baseline schools were not selected and confirmed in Kampala District for another three weeks. Therefore, we were delayed in our ability to use the PSM to select comparison schools, and had to confirm the selected schools just days before data collection began.

Figure 4: Timeline of Data Collection

Baseline 2018 Timeline	MARCH			APRIL																						JUNE		
Activity	29	30	31	1	2	3	4	5	6	7	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	6	7	8
1. Piloting of baseline survey instruments																												
2. Incorporate feedback from piloting																												
3. Reviewing and updating final packages of tools																												
4. Recruitment of field staff																												
5. Developing training materials and planning logistics																												
6. District and school mobilization																												
7. Training of field staff																												
8. Practical exercise with field staff																												
9. Field work																												
10. Receiving hardcopy materials from field teams																												
11. Replacement school enumerator training																												
12. Replacement school call-backs																												

3.4.3 Ethical Considerations and IRB Approval

Ethics oversight for this study comes from a Ugandan-based Institutional Review Board (IRB) at Makerere University's School of Biomedical Sciences Research Committee (SBSREC) and the National Council of Science and Technology. Results and study updates will be shared with both entities as well as the Ministry of Education's Basic Education and Monitoring and Evaluation Working Groups.

Adult participants (teachers) were given an informed consent form to read and sign. Minors are included in the study, namely children in the selected ECD centers. This is necessary because the goal of the study is to measure the effect of the AKFU program on the school readiness of these children. Parents of the children in the selected ECD centers signed a consent form for their children to participate in the study. Illiterate parents had the form read and explained to them. The consent form was written in English and translated into Luganda before use; the consent was conducted in either English or Luganda. Completed consents are stored at the Ichuli offices in Kampala, near the schools included in the study.

We expect no physical, psychological, social or legal risks to respondents. The main risk is of a breach of confidentiality. This risk will be mitigated by storing all identifiable data securely using encrypted, password-protected files, and by anonymizing data (removing participant names) prior to analysis. If at any point monitoring shows any potential harm to participants as a result of their participation in the study, we will consult immediately with ELMA and AKFU on further measures, including potentially halting the study. As noted above, we have no reason to believe that there are any risks to our participants.

4 Baseline Equivalency

4.1 Methodology

A successful baseline shows that the treatment and comparison groups are equivalent across observable measures, i.e. there is no statistical difference between the two groups. This is known as baseline equivalence or baseline balance. A baseline that is biased will show that there are statistically different outcomes between treatment arms even prior to any intervention taking place in the schools.

We employ these same baseline equivalency techniques that are used in RCTs, although this is more of a quasi-experimental evaluation. Data analysis is primarily presented in a simplified format in which treatment and comparison means are presented side-by-side; it is clearly indicated if the difference between the treatment and comparison means on any one measure is significant. It should be noted that the analysis at the school level takes into account the fact that children are nested within centers; therefore, the analysis was done using clustered standard errors. This is mentioned in the footnotes of the relevant tables. Results are presented for the IDELA scores, school facilities, teacher interviews and teacher classroom observations. This method allows us to know more about the baseline sample and whether or not the initial assignment of comparison schools to treatment schools was clean. That being said, one of the limitations of this survey is that AKFU trained the teachers prior to the baseline being executed. That means that we are unable to ascertain with absolute certainty which teacher behaviors or attitudes were affected by the training and which would have been different from the comparison school teachers just due to random chance. It is likely that this most affects the teacher interview and teacher classroom observation data. It is somewhat, although less likely, that this has an effect on the IDELA scores of the children because the teachers were only trained once on largely non-instructional content, meaning it is likely that this interaction would not have a limited impact on learning outcomes for the children enrolled in the study. Additionally, it is unlikely that this single teacher training had an impact on the school enrollment and facilities.

This section starts with baseline results for the school enrollment and facilities and then provides information on teachers, which is comprised of results from the classroom observations and teacher interviews. The section concludes with an analysis on the children, principally through the school readiness assessment.

4.2 Baseline Equivalency Tests for School Enrollment and Facilities

This section presents the baseline equivalence tests for school facilities, infrastructure and school management. In general, treatment and comparison schools are fairly equal across these categories. There are 15 instances in which there is a statistically significant difference between treatment and comparison schools out of the 152 total variables that were measured. That amounts to 9.87% of the variables differing significantly across treatment and comparison, which is less than what would occur by chance. This is a positive indication that the equivalency for school enrollment and facilities is clean and unbiased at baseline. One notable exception could be the table on literacy, numeracy and play materials, where treatment schools are highly significantly likely to have more of these items than comparison schools. We theorize that this is possibly due to the teacher training and materials provision components of AKFU's intervention prior to the baseline, but this remains to be confirmed by AKFU.

Treatment schools are more 12 percentage points likely to have a Middle class and 17 percentage points more likely to have a Top class. The difference in Top class across treatment and comparison is statistically significant. Treatment schools with a Top class have on average around 5 more girls enrolled than in comparison schools. This difference is also statistically significant.

Treatment schools have on average around one teacher more per school than comparison schools. This is due to the fact that the treatment schools are more likely to have the Middle and Top classes. Treatment and comparison schools are both equally as likely to have a School Management Committee with around 60 percent of the schools having one.

Table 6: Child and Teacher Enrollment

	Variable	Comparison	Treatment	Difference in Means
Baby Class				
(1)	School has Baby Class (Yes/ No)	1.00	0.98	0.03
		(0.00)	(0.03)	(0.03)
(2)	If yes, boys enrolled	15.80	16.38	-0.58
		(1.28)	(1.35)	(1.87)
(3)	If yes, girls enrolled	14.10	15.05	-0.95
		(1.28)	(1.64)	(2.08)
Middle Class				
(4)	School has Middle Class (Yes/ No)	0.80	0.93	-0.12
		(0.06)	(0.04)	(0.08)
(5)	If yes, boys enrolled	16.26	13.81	2.45
		(1.74)	(1.69)	(2.42)
(6)	If yes, girls enrolled	13.62	12.43	1.19
		(1.41)	(1.34)	(1.95)
Top Class				
(7)	School has Top Class (Yes/ No)	0.73	0.90	-0.17**
		(0.07)	(0.05)	(0.09)
(8)	If yes, boys enrolled	14.69	17.06	-2.37
		(1.79)	(2.57)	(3.13)
(9)	If yes, girls enrolled	11.59	16.33	-4.75*

		(1.47)	(2.26)	(2.69)
Total Enrollment				
(10)	Average total children enrolled	72.45	84.62	-12.18
		(7.09)	(9.45)	(11.81)
Teacher Enrollment				
(11)	Male ECD teachers	0.03	0.08	-0.05
		(0.03)	(0.04)	(0.05)
(12)	Female ECD teachers	2.60	3.28	-0.68*
		(0.26)	(0.25)	(0.36)
School Management Committee (SMC)				
(13)	School has SMC (Yes/ No)	0.65	0.67	-0.02
		(0.08)	(0.08)	(0.11)
	N	40	40	80

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Many schools have an education policy, which includes components on inclusion (as stipulated by the MOES), but they are not very likely to have a copy of their Child Protection Policy. Comparison schools are more likely to have this document than treatment schools. Many schools keep records of the lesson plans and of the curriculum. However, schools do not typically have copies of policies and documents from the Ministry of Education. While some schools display the rules and regulations, many do not. That is the case for general school rules, as well as for specific policies on violence prevention and school health and hygiene. Comparison schools are more likely to display disciplinary charts and to post school rules. In general, there are some large differences between comparison and control schools, but these differences are not statistically significant.

Table 7: School Policies and Management

	Variable	Comparison	Treatment	Difference in Means
(1)	Does the school have an Inclusive Education Policy?	0.82	0.82	0.00
		(0.06)	(0.06)	(0.09)
(2)	Does the school have a copy of the Child Protection Policy?	0.50	0.38	0.12
		(0.08)	(0.08)	(0.11)
(3)	Does the school keep records of lesson plans?	0.80	0.88	-0.08
		(0.06)	(0.05)	(0.08)
(4)	Does the school keep records of the curriculum?	0.82	0.80	0.02
		(0.06)	(0.06)	(0.09)
(5)	Are the school rules displayed?	0.46	0.32	0.14
		(0.08)	(0.08)	(0.11)
(6)	Are there rules on violence prevention and management written/displayed?	0.32	0.43	-0.11
		(0.08)	(0.08)	(0.11)
(7)	Are there disciplinary charts displayed in classrooms?	0.31	0.18	0.12
		(0.07)	(0.06)	(0.10)
(8)	Are there copies of MOES policies and documents?	0.55	0.44	0.12
		(0.08)	(0.08)	(0.11)
(9)	Are the school health, hygiene, sanitation and environmental rules and regulations displayed?	0.30	0.38	-0.08
		(0.08)	(0.08)	(0.11)

N	40	40	80

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

In WASH practices, there are only three statistically significant differences between treatment and comparison schools. This is regarding the presence of a water tank, handwashing facilities for children, and the number of latrines for boys (there were no statistically significant findings for girls' latrines). Treatment schools are more likely to have all of these things available at the school. In general, water tanks and boreholes are the most common water source at the schools and their working condition, hygiene and accessibility are fairly good. Schools are slightly more likely to have safe drinking water available for the teachers than for the children, and a little over 40 percent of the comparison schools do not have safe water available for the children at all. This compares to around 35 percent in treatment schools. Nearly all of the schools have separate latrines for boys and girls at the school.

Table 8: Water, Sanitation and Hygiene Facilities

	Variable	Comparison	Treatment	Difference in Means
Water tank				
(1)	Present	0.71	0.87	-0.16*
		(0.07)	(0.05)	(0.09)
(2)	If yes, quantity	1.81	2.06	-0.25
		(0.26)	(0.29)	(0.39)
(3)	If yes, working condition	2.72	2.65	0.07
		(0.14)	(0.12)	(0.18)
(4)	If yes, hygiene condition	2.62	2.41	0.21
		(0.14)	(0.14)	(0.20)
(5)	If yes, accessibility	2.77	2.65	0.12
		(0.13)	(0.13)	(0.18)
Borehole				
(6)	Present	0.26	0.26	0.01
		(0.07)	(0.07)	(0.10)
(7)	If yes, quantity	1.00	1.00	0.00
		(0.00)	(0.00)	(0.00)
(8)	If yes, working condition	2.60	2.73	-0.13
		(0.22)	(0.19)	(0.29)
(9)	If yes, hygiene condition	2.64	2.70	-0.06
		(0.20)	(0.21)	(0.29)
(10)	If yes, accessibility	2.18	2.60	-0.42
		(0.23)	(0.27)	(0.35)
Well				
(11)	Present	0.11	0.05	0.05
		(0.05)	(0.04)	(0.06)
Safe drinking water for pupils				
(12)	Present	0.57	0.65	-0.08
		(0.08)	(0.08)	(0.12)
(13)	If yes, quantity	1.38	1.36	0.02
		(0.15)	(0.19)	(0.24)
(14)	If yes, working condition	2.81	2.56	0.25
		(0.11)	(0.15)	(0.19)
(15)	If yes, hygiene condition	2.67	2.54	0.12
		(0.14)	(0.15)	(0.21)
(16)	If yes, accessibility	2.68	2.52	0.16
		(0.14)	(0.17)	(0.22)
Safe drinking water for teachers				
(17)	Present	0.59	0.70	-0.11
		(0.08)	(0.08)	(0.11)
(18)	If yes, quantity	1.14	1.12	0.02
		(0.10)	(0.14)	(0.17)
(19)	If yes, working condition	2.78	2.85	-0.07
		(0.11)	(0.10)	(0.15)

(20)	If yes, hygiene condition	2.65	2.81	-0.16
		(0.15)	(0.09)	(0.18)
(21)	If yes, accessibility	2.62	2.77	-0.14
		(0.15)	(0.13)	(0.19)
Latrines for Boys				
(22)	Present	1.00	1.00	0.00
		(0.00)	(0.00)	(0.00)
(23)	If yes, quantity	2.84	3.71	-0.88*
		(0.30)	(0.41)	(0.51)
(24)	If yes, working condition	2.68	2.62	0.06
		(0.09)	(0.10)	(0.14)
(25)	If yes, hygiene condition	2.14	1.92	0.21
		(0.14)	(0.11)	(0.18)
(26)	If yes, accessibility	2.89	2.71	0.18
		(0.08)	(0.11)	(0.13)
Latrines for Girls				
(27)	Present	0.97	1.00	-0.03
		(0.03)	(0.00)	(0.03)
(28)	If yes, quantity	2.97	3.71	-0.74
		(0.30)	(0.40)	(0.50)
(29)	If yes, working condition	2.68	2.65	0.03
		(0.09)	(0.09)	(0.13)
(30)	If yes, hygiene condition	2.08	2.03	0.05
		(0.13)	(0.11)	(0.17)
(31)	If yes, accessibility	2.89	2.73	0.16
		(0.08)	(0.11)	(0.13)
Latrines for Teachers				
(32)	Present	0.95	0.89	0.05
		(0.04)	(0.05)	(0.06)
(33)	If yes, quantity	2.03	2.43	-0.40
		(0.23)	(0.28)	(0.36)
(34)	If yes, working condition	2.73	2.74	-0.01
		(0.08)	(0.08)	(0.11)
(35)	If yes, hygiene condition	2.37	2.36	0.01
		(0.12)	(0.12)	(0.18)
(36)	If yes, accessibility	2.78	2.79	-0.02
		(0.10)	(0.09)	(0.14)
Handwashing facilities for Pupils				
(36)	Present	0.74	0.92	-0.18*
		(0.07)	(0.06)	(0.09)
(37)	If yes, quantity	1.85	1.55	0.30
		(0.32)	(0.20)	(0.37)
(38)	If yes, working condition	2.73	2.66	0.08
		(0.11)	(0.12)	(0.16)
(39)	If yes, hygiene condition	2.53	2.53	0.00
		(0.13)	(0.11)	(0.17)
(40)	If yes, accessibility	2.77	2.72	0.05
		(0.11)	(0.12)	(0.17)
Handwashing facilities for Teachers				
(41)	Present	0.67	0.76	-0.09
		(0.08)	(0.07)	(0.10)
(42)	If yes, quantity	1.52	1.04	0.48
		(0.33)	(0.08)	(0.33)
(43)	If yes, working condition	2.78	2.63	0.14
		(0.11)	(0.12)	(0.17)
(44)	If yes, hygiene condition	2.56	2.48	0.07
		(0.14)	(0.12)	(0.19)
(45)	If yes, accessibility	2.74	2.74	0.00
		(0.13)	(0.13)	(0.18)
	N	40	40	80

*Notes: Working Condition, Hygiene, and Accessibility are all on scales from 1 to 3 with the higher number equating to a better rating. Working Condition (1- Hazardous and unsafe, 2- Minor Faults, 3- In Use), Hygiene (1- Inadequate, 2- Minor Issues, 3- Very Clean), Accessibility (1- Inaccessible, 2- Not easily accessible, 3- Very accessible). Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Most schools do not have a resource and play center. Treatment schools are 11 percentage points more likely to have one. However, the data from the schools shows that the centers are not used by children in the schools that do have them. In addition, many of the play centers do not actually contain play materials. The majority of schools do have an outside playground that is available for the children to use and is in working condition.

Table 9: Play and Resource Centers

	Variable	Comparison	Treatment	Difference in Means
Resource and Play Center				
(1)	Is there a resource and play center?	0.25	0.36	-0.11
		(0.07)	(0.08)	(0.10)
(2)	If yes, working condition (1-3)	2.67	2.21	0.45
		(0.24)	(0.26)	(0.36)
(3)	Is the resource and play centre used by the pupils?	0.37	0.42	-0.05
		(0.09)	(0.09)	(0.13)
Play Materials				
(4)	Does the resource and play center contain play materials?	0.33	0.40	-0.07
		(0.11)	(0.09)	(0.14)
(5)	If yes, working condition (1-3)	2.43	2.18	0.25
		(0.37)	(0.30)	(0.47)
Outside Playground				
(6)	Is there an outside playground?	0.85	0.85	0.00
		(0.06)	(0.06)	(0.08)
(7)	Working condition (1-3)	2.65	2.57	0.09
		(0.15)	(0.12)	(0.20)
(8)	Are nursery school pupils allowed to play in the playground?	0.79	0.81	-0.02
		(0.07)	(0.07)	(0.09)
	N	40	40	80

*Notes: Working Condition is on a scale from 1 to 3 with the higher number equating to a better rating (1- Inadequate, 2- Minor Faults, 3- Good), Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Treatment schools are more likely to have a rubbish pit and bins around the compound; therefore, they have a more hygienic compound than comparison schools. Many schools have a playground, but are less likely to have play equipment. The schools typically have an access road, but many do not have a demarcated boundary. All of the schools have walls that are made from brick and cement and roofs that are made from iron sheets. The most common material for the floor is concrete, although some schools have mud floors. Treatment schools are more likely to have cement floors and this is statistically significant. Most schools have windows in the classroom, and some of the schools have shutters on the windows that can close. Nearly all of the classrooms have doors that are lockable.

Around 85 percent of treatment and comparison schools have desks available for the children, and on average there are around 20 desks in a classroom. Schools are less likely to have chairs for the desks. There are around 4 children per desk in both treatment and comparison schools. Chalkboards are common in both treatment and comparison classrooms, while clocks are somewhat rare in both. Treatment schools are more likely to have cupboards or bookshelves in the classroom at a rate of around 44 percent. Enumerators report that there is more free space to move around in treatment school classrooms than in comparison school classrooms, and this difference is significant.

Differences between treatment and control schools in these findings could be reflective of the type of school selected by district officials for inclusion in the program; it is possible that they selected more established schools or those that they felt were better placed to benefit from AKF's intervention. As schools were not selected at random, district-led identification of schools was subjective, as long as they met the minimum requirements stipulated by AKF. Despite this, it is important to note that there were only three statistically significant differences between treatment and comparison schools in the study, despite the long list of characteristics analyzed.

Table 10: Condition of Compounds and Buildings

	Variable	Comparison	Treatment	Difference in Means
Quality of School Compound				
(1)	Hygiene condition of the compound (1-3)	2.33	2.55	-0.22
		(0.12)	(0.10)	(0.16)
(2)	Rubbish pit	0.68	0.90	-0.21**
		(0.08)	(0.05)	(0.09)
(3)	Rubbish bins around the compound	0.38	0.46	-0.09
		(0.08)	(0.08)	(0.11)
(4)	Play ground	0.88	0.88	0.00
		(0.05)	(0.05)	(0.07)
(5)	Play equipment	0.40	0.33	0.07
		(0.08)	(0.08)	(0.12)
(6)	Access road	0.77	0.88	-0.10
		(0.07)	(0.05)	(0.09)
(7)	If yes, condition of the access road (1-3)	2.53	2.62	-0.09
		(0.10)	(0.10)	(0.14)
(8)	Demarcated boundary	0.55	0.69	-0.14
		(0.09)	(0.07)	(0.12)
Building Structure				
(9)	Walls are made from brick and cement	1.00	1.00	0.00
		(0.00)	(0.00)	(0.00)
(10)	Roof is made iron sheets	1.00	1.00	0.00
		(0.00)	(0.00)	(0.00)
Floor Material				
(11)	Concrete floor	0.88	1.00	-0.12**
		(0.05)	(0.00)	(0.05)
(12)	If yes, working condition (1-3)	2.62	2.82	-0.20
		(0.13)	(0.07)	(0.15)
(13)	Mud floor	0.18	0.10	0.08
		(0.06)	(0.05)	(0.08)
(14)	If yes, working condition (1-3)	2.75	2.50	0.25
		(0.25)	(0.50)	(0.51)
Window Frames				
(15)	Window Frames	0.82	0.93	-0.10
		(0.06)	(0.04)	(0.07)
(16)	If yes, quantity	5.89	6.79	-0.90
		(0.81)	(1.36)	(1.59)
(17)	If yes, working condition (1-3)	2.71	2.61	0.11
		(0.14)	(0.11)	(0.17)
Window Shutters				
(18)	Window Shutters	0.57	0.62	-0.05
		(0.08)	(0.08)	(0.11)
(19)	If yes, quantity	6.79	6.83	-0.04
		(1.97)	(1.85)	(2.70)
(20)	If yes, working condition (1-3)	2.20	2.50	-0.30
		(0.22)	(0.14)	(0.26)
Door frames				
(21)	Door frames	0.82	0.90	-0.08
		(0.06)	(0.05)	(0.08)
(22)	If yes, quantity	2.86	2.25	0.61
		(0.65)	(0.32)	(0.72)
(23)	If yes, working condition (1-3)	2.80	2.80	0.00

		(0.09)	(0.07)	(0.12)
Lockable doors				
(24)	Lockable doors	0.88	0.93	-0.05
		(0.05)	(0.04)	(0.07)
(25)	If yes, quantity	2.18	2.06	0.12
		(0.34)	(0.26)	(0.43)
(26)	If yes, working condition (1-3)	2.68	2.84	-0.16
		(0.14)	(0.07)	(0.15)
Desks				
(27)	Desks	0.85	0.85	0.00
		(0.06)	(0.06)	(0.08)
(28)	If yes, quantity	17.66	20.23	-2.57
		(3.40)	(3.79)	(5.08)
(29)	If yes, working condition (1-3)	2.79	2.79	0.00
		(0.08)	(0.10)	(0.14)
Chairs				
(30)	Chairs	0.65	0.74	-0.09
		(0.08)	(0.07)	(0.10)
(31)	If yes, quantity	11.35	28.30	-16.95**
		(4.17)	(6.25)	(7.52)
(32)	If yes, working condition (1-3)	2.56	2.83	-0.28
		(0.17)	(0.10)	(0.20)
Chalkboards and chalk				
(33)	Chalkboards and chalk	0.95	1.00	-0.05
		(0.03)	(0.00)	(0.03)
(34)	If yes, quantity	2.50	2.66	-0.16
		(0.34)	(0.32)	(0.47)
(35)	If yes, working condition (1-3)	2.45	2.71	-0.25
		(0.17)	(0.11)	(0.20)
Wall clock				
(36)	Wall clock	0.15	0.15	0.00
		(0.06)	(0.06)	(0.08)
(37)	If yes, quantity	2.17	1.00	1.17**
		(0.40)	(0.27)	(0.48)
(38)	If yes, working condition (1-3)	2.50	2.80	-0.30
		(0.50)	(0.20)	(0.53)
Cupboard/bookshelves				
(39)	Cupboard/bookshelves	0.28	0.44	-0.15
		(0.07)	(0.08)	(0.11)
(40)	If yes, quantity	1.70	1.72	-0.02
		(0.30)	(0.33)	(0.45)
(41)	If yes, working condition (1-3)	2.71	2.50	0.21
		(0.18)	(0.18)	(0.26)
Spacing in Classroom				
(42)	What is the average number of pupils per desk?	3.78	3.94	-0.16
		(0.33)	(0.33)	(0.46)
(43)	Can you move freely in the classroom when pupils are there?	0.64	0.82	-0.18*
		(0.08)	(0.06)	(0.10)
	N	40	40	80

*Notes: Working Condition is on a scale from 1 to 3 with the higher number equating to a better rating (1- Inadequate, 2- Minor Faults, 3- Good), Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

The majority of schools have a feeding program for the children that is funded in part or fully by parental contributions. Schools are even more likely to provide meals to teachers at the school. The standard of the meals and the hygienic condition of feeding facilities are both reported to have minor issues.

Table 11: Feeding Programs

	Variable	Comparison	Treatment	Difference in Means
(1)	Does the school provide meals to pupils?	0.90	0.85	0.05
		(0.05)	(0.06)	(0.07)
(2)	Do parents pay or contribute to the school meals?	0.87	0.82	0.05
		(0.05)	(0.06)	(0.08)
(3)	Does the school provide meals to teachers?	0.98	0.93	0.05
		(0.04)	(0.04)	(0.06)
(4)	Does the school have a cooking area?	0.93	0.98	-0.05
		(0.04)	(0.03)	(0.05)
(5)	Rate standard of the school meals (1-3)	2.16	2.18	-0.03
		(0.12)	(0.12)	(0.17)
(6)	Rate the hygiene condition of the cooking area facilities (1-3)	2.08	1.97	0.11
		(0.12)	(0.09)	(0.16)
(7)	Rate the working condition of the cooking area facilities (1-3)	2.22	2.10	0.11
		(0.12)	(0.11)	(0.16)
	N	40	40	80

*Notes: Working Condition is on a scale from 1 to 3 with the higher number equating to a better rating (1- Inadequate, 2- Minor Faults, 3- Good), Hygiene (1- Inadequate, 2- Minor Issues, 3- Very Clean) Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Treatment schools are significantly more likely to have literacy, numeracy and play materials available. This may be as a result of some of the schools receiving materials from AKFU prior to the baseline survey. This will have to be confirmed by AKFU. Numeracy and play materials are more likely to be locally made than bought. Literacy materials, however, are equally likely to bought as they are to be locally made.

Table 12: Literacy, Numeracy and Play Materials

	Variable	Comparison	Treatment	Difference in Means
Literacy Materials				
(1)	Does the school have literacy materials?	0.62	0.85	-0.22**
		(0.08)	(0.06)	(0.10)
(2)	Kept in library	0.22	0.23	-0.01
		(0.07)	(0.07)	(0.10)
(3)	Kept in HTs office	0.26	0.41	-0.15
		(0.09)	(0.09)	(0.13)
(4)	Kept in staff room	0.19	0.15	0.04
		(0.08)	(0.06)	(0.10)
(5)	Kept in 'other'	0.55	0.66	-0.11
		(0.11)	(0.09)	(0.15)
(6)	Materials were bought	0.50	0.41	0.09
		(0.11)	(0.09)	(0.14)
(7)	Materials are locally made	0.50	0.59	-0.09
		(0.11)	(0.09)	(0.14)
Numeracy Materials				
(8)	Does the school have numeracy materials?	0.53	0.88	-0.35***
		(0.08)	(0.05)	(0.10)
(9)	Kept in library	0.10	0.05	0.05
		(0.06)	(0.04)	(0.07)
(10)	Kept in HTs office	0.11	0.03	0.08
		(0.06)	(0.03)	(0.07)
(11)	Kept in staff room	0.08	0.05	0.03
		(0.05)	(0.03)	(0.06)
(12)	Kept in 'other'	0.60	0.77	-0.17

		(0.10)	(0.07)	(0.12)
(13)	Materials were bought	0.12	0.15	-0.02
		(0.09)	(0.07)	(0.11)
(14)	Materials are locally made	0.88	0.85	0.02
		(0.09)	(0.07)	(0.11)
Play Materials				
(15)	Does the school have play materials?	0.36	0.68	-0.32***
		(0.09)	(0.08)	(0.11)
(16)	Kept in library	0.04	0.00	0.04
		(0.04)	(0.00)	(0.04)
(17)	Kept in HTs office	0.00	0.08	-0.08*
		(0.00)	(0.05)	(0.05)
(18)	Kept in staff room	0.00	0.03	-0.03
		(0.00)	(0.03)	(0.03)
(19)	Kept in 'other'	0.50	0.64	-0.14
		(0.10)	(0.08)	(0.13)
(20)	Materials were bought	0.33	0.25	0.08
		(0.17)	(0.09)	(0.19)
(21)	Materials are locally made	0.67	0.75	-0.08
		(0.17)	(0.09)	(0.19)
	N	40	40	80

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Most treatment and comparison schools have enrollment and attendance records for both teachers and children, and these records are typically filled consistently throughout the term. In addition, many schools have a list of teachers and their qualifications and are good about keeping this updated. Schools also keep a record of the report cards or termly marks that are distributed to children.

Table 13: Attendance and Registers

	Variable	Comparison	Treatment	Difference in Means
(1)	Pupil enrollment roster/book and attendance records	0.88	0.97	-0.10
		(0.05)	(0.03)	(0.06)
(2)	Records have been filled in consistently since the start of term	0.82	0.90	-0.07
		(0.07)	(0.05)	(0.08)
(3)	Teacher's register and teacher attendance records	0.79	0.85	-0.06
		(0.07)	(0.06)	(0.09)
(4)	Records have been filled in consistently since the start of term	0.84	0.84	0.00
		(0.07)	(0.06)	(0.09)
(5)	Updated list of teachers and their qualifications	0.70	0.73	-0.02
		(0.08)	(0.07)	(0.10)
(6)	Records have been filled in consistently since the start of term	0.86	0.71	0.15
		(0.07)	(0.08)	(0.10)
(7)	Does the school keep a record of pupil report cards or termly marks?	0.83	0.84	0.00
		(0.06)	(0.06)	(0.09)
	N	40	40	80

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

4.3 Baseline Equivalency Tests for Teachers

Teachers were surveyed using two methods. The first was a classroom observation by enumerators and the second was an in-depth interview with each teacher. The original sampling strategy was to observe a classroom lesson of one teacher from Baby class and one teacher from Middle class and then interview these teachers. Therefore, the ideal number was originally a total of 160 teachers for both the interview and the observation. Given the lack of Middle class in 11 schools (3 treatment and 8 comparison) and absenteeism by teachers, this was not the reality in the field. In total 136 teachers were interviewed and 123 were observed. Because the children in ECD go home early, the pupil assessments were given the greatest priority. Therefore, there were times in which the children went home after the pupil assessments and therefore classroom observations could not be conducted. Thus, the number of classroom observations is less than the total number of interviews. This section will start with the results from the teacher interview and then proceed to results regarding the classroom observations.

Teacher Interview

The tables below present results from the teacher interview that was conducted as baseline. Teachers in both Baby and Middle class were surveyed one-on-one by a trained enumerator on their opinions, beliefs, practices and experience in ECD. In total, 62 teachers were interviewed from comparison schools and 74 were interviewed from treatment schools. This discrepancy is due in part to treatment schools being more likely to have Middle and Baby classes in their schools and have a larger enrollment of learners. In 8 comparison schools, there was no Middle class from which to collect data. This occurred less in treatment schools where there were only 3 schools which had no Middle class. It should also be recognized that some of the treatment school teachers were trained by AKFU prior to the baseline survey and therefore it is possible that some of these differences are a result of that, although training content prior to Term 1 did not explicitly involve instructional strategies.

Table 14 shows the background information on the teachers in both groups. This helps to contextualize some of the differences that may be seen between the treatment and comparison teachers. On average, teachers in comparison schools have a little over a half of a year more experience in their current class than the treatment school teachers, but both groups are fairly equal for their total years as a teacher and as a teacher in pre-primary. The most common highest level of education for these teachers is the U.C.E. level. Comparison school teachers are more likely to have a U.C.E. certificate than treatment school teachers by 18 percentage points. However, treatment teachers are more likely to have an A-level certificate or to have completed a diploma than comparison school teachers. Those who reported “other” state the following as options: ECD Certificate, Grade III certificate, Classical education, and Grade A certificate.

Treatment school teachers are less likely to have their certificate in ECD than comparison school teachers. Of the comparison school teachers, 40 percent have the Normal Certificate in ECD and 23 percent have the Grade A certificate. This compares to 28 percent and 20 percent, respectively, in treatment schools. In the “other” category, teachers report that they are currently undergoing training and study courses in order to obtain their certificate. This is more common for treatment teachers (4 teachers) than comparison school teachers (1).

While most of these teachers are professional ECD teachers, there were also teachers interviewed who are paraprofessionals or teaching assistants. It is more common for comparison school teachers to be doubling as both a pre-primary and as a primary teacher in their schools.

Table 14: Teacher Demographic Information

	Variable	Comparison	Treatment	Difference in Means
Professional Experience				
(1)	Years in this class	3.59	3.03	0.56
		(0.40)	(0.39)	(0.56)
(2)	Years as a teacher	5.95	5.69	0.26
		(0.73)	(0.49)	(0.88)
(3)	Years in pre-primary	4.57	4.88	-0.31
		(0.56)	(0.51)	(0.77)
Highest Level of Education				
(4)	PLE Certificate	0.00	0.01	-0.01
		(0.00)	(0.01)	(0.01)
(5)	U.C.E Certificate	0.68	0.50	0.18**
		(0.07)	(0.06)	(0.09)
(6)	A level certificate	0.06	0.15	-0.08
		(0.03)	(0.04)	(0.05)
(7)	Degree/ Diploma completed	0.03	0.12	-0.09*
		(0.02)	(0.04)	(0.05)
(8)	Other	0.21	0.14	0.07
		(0.05)	(0.04)	(0.07)
Certificate in Early Childhood Development				
(9)	No	0.27	0.43	-0.16
		(0.07)	(0.07)	(0.10)
(10)	Normal Certificate	0.40	0.28	0.12
		(0.08)	(0.06)	(0.10)
(11)	Grade A certificate	0.23	0.20	0.02
		(0.06)	(0.06)	(0.08)
(12)	Diploma	0.00	0.05	-0.05*
		(0.00)	(0.03)	(0.03)
(13)	Other (specify)	0.10	0.03	0.07
		(0.04)	(0.02)	(0.05)
Teach Pre-Primary and Primary				
(14)	Professional teacher teaching only pre-primary	0.65	0.73	-0.08
		(0.07)	(0.06)	(0.09)
(15)	Professional teacher teaching pre-primary and a higher grade	0.13	0.05	0.07
		(0.05)	(0.04)	(0.06)
(16)	Para-professional or Assistant Teacher (includes Volunteer Teachers)	0.23	0.22	0.01
		(0.06)	(0.05)	(0.08)
	N (Teachers Interviewed)	62	74	136

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

In the payment and compensation section, teachers were invited to choose as many categories of compensation that applied to them. Comparison school teachers are more likely to say that they are paid or otherwise compensated for their work as a teacher. About one-fourth of the comparison school teachers say that they get food or housing as further compensation. Treatment school teachers are less likely to say this. Both treatment and comparison school teachers are paid primarily through the head teacher of the school and make on average around 180,000 Ugandan shillings per month. The majority of teachers were paid in full in the last month, but around 10 percent of teachers in both groups say that they had not received anything for last month's pay.

Table 15: Teacher Payment and Compensation

	Variable	Comparison	Treatment	Difference in Means
Payment and Compensation				
(1)	Do you get paid or compensated for your work teaching this pre-primary class?	0.97	0.91	0.06
		(0.02)	(0.04)	(0.05)
(2)	Money	0.94	0.88	0.06
		(0.03)	(0.04)	(0.05)
(3)	Food	0.24	0.19	0.05
		(0.06)	(0.05)	(0.07)
(4)	Transport	0.00	0.05	-0.05**
		(0.00)	(0.03)	(0.03)
(5)	Housing	0.26	0.08	0.18**
		(0.06)	(0.03)	(0.07)
(6)	Other (specify)	0.00	0.00	0.00
		(0.00)	(0.00)	(0.00)
Who pays you?				
(7)	Paid by the head teacher	0.81	0.80	0.01
		(0.07)	(0.05)	(0.08)
(8)	Paid by school director	0.17	0.17	0.00
		(0.07)	(0.05)	(0.08)
(9)	Paid by parents/community	0.00	0.03	-0.03
		(0.00)	(0.02)	(0.02)
(10)	Paid by an NGO	0.02	0.00	0.02
		(0.02)	(0.00)	(0.02)
(11)	Teaching Salary per Month (in shillings)	175,741.38	180,682.3	-49,40.91
		(13840.03)	(15792.43)	(21076.40)
Last Month's Pay				
(12)	Nothing	0.09	0.11	-0.02
		(0.04)	(0.04)	(0.06)
(13)	Full salary/compensation	0.83	0.78	0.04
		(0.05)	(0.06)	(0.08)
(14)	More than half of what I am supposed to get paid	0.02	0.02	0.00
		(0.02)	(0.02)	(0.02)
(15)	Half of what I am supposed to get paid	0.03	0.05	-0.01
		(0.02)	(0.03)	(0.04)
(16)	Less than half of what I am supposed to get paid	0.03	0.05	-0.01
		(0.02)	(0.03)	(0.04)
(17)	Are you generally paid on time?	0.76	0.68	0.08
		(0.06)	(0.06)	(0.09)
	N (Teachers Interviewed)	62	74	136

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Teachers were also asked why they decided to get into the ECD profession. Teachers were instructed to select as many answers as they felt applied to them. The majority of teachers say that they enjoy teaching young

children. In addition, 20 percent of teachers in the treatment group and 6 percent in the comparison group state "other" and give an open-ended response. A selection of responses on the positive side shows that teachers state that they are inspired to do so by role models, want to start up their own ECD centers, think nursery learners are challenging and interesting to teach and/or they want to develop the nation's next generation. Other candid responses include that it was the cheapest course that they could afford, it is the one that they could manage, or that they did not qualify for training as a primary teacher but did as a pre-primary teacher. In addition, the responses show that teachers from comparison schools are more likely to have started in another grade level and been re-assigned to pre-primary. This could also be an explanation as to why comparison school teachers are less likely to state that they enjoy teaching young children. It also may mean that comparison teachers will be more likely to change grades prior to endline. This should be monitored so that it does not result in differential attrition.

Teachers were also asked about their aspirations for their career within the next one to five years. Many teachers (50 percent) in comparison schools say that they would like to go and study pre-primary education further. This is significantly higher than those in treatment schools, where around 30 percent of teachers state a desire to do this. Larger percentages of teachers in both treatment and comparison say that they wish to stay an ECD teacher in the next 5 years and not change professions. A significant portion of teachers in both comparison and treatment schools give the "other" response. In treatment schools 25 teachers say they would like to start up their own ECD center within the next 5 years. In comparison schools 13 teachers say the same. Four teachers in treatment schools and four teachers in comparison schools state that they would like to go for an upgrade in education to the diploma level. Overall, 70 percent of comparison school teachers and 62 percent of treatment teachers state that they do not plan to stay working as a pre-primary teacher in their current school. This finding has an important implication for program success if trained teachers leave the centers after they have been supported by AKF. These teachers are also a potential attrition risk and therefore monitoring should be done on these teachers so that as many of the same baseline teachers as possible can be retained in the sample and interviewed at endline.

Table 16: Teacher Motivation

	Variable	Comparison	Treatment	Difference in Means
Why did you become a primary teacher? (mark all that apply)				
(1)	I was at another level and re-assigned to pre-primary	0.08	0.00	0.08**
		(0.03)	(0.00)	(0.03)
(2)	Learn skills	0.03	0.08	-0.05
		(0.02)	(0.04)	(0.04)
(3)	Teaching young children because it is simple and everybody can teach	0.08	0.07	0.01
		(0.04)	(0.03)	(0.05)
(4)	Nothing else to do	0.06	0.07	0.00
		(0.03)	(0.03)	(0.04)
(5)	I like teaching young children	0.79	0.89	-0.10
		(0.05)	(0.03)	(0.06)
(6)	So my child could attend pre-school	0.02	0.00	0.02
		(0.02)	(0.00)	(0.02)
(7)	To earn money	0.11	0.12	-0.01
		(0.05)	(0.04)	(0.06)
(8)	Other (specify)	0.06	0.20	-0.14**
		(0.03)	(0.05)	(0.06)
What do you plan to do for the next 1-5 years?				
(9)	Plan to stay as pre-primary teach	0.27	0.38	-0.10
		(0.07)	(0.06)	(0.09)
(10)	Plan to work as teacher at other school	0.10	0.07	0.03
		(0.04)	(0.03)	(0.05)
(11)	Plan to go study pre-primary education	0.50	0.27	0.23***
		(0.06)	(0.05)	(0.08)
(12)	Plan to go study something else	0.10	0.04	0.06
		(0.04)	(0.02)	(0.05)

(13)	Other (specify)	0.35	0.64	-0.28***
		(0.07)	(0.06)	(0.09)
	N (Teachers Interviewed)	62	74	136

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 17 presents results from the teacher assessment of the pre-primary system. These results are fairly balanced between treatment and control with the majority of teachers in both groups stating that they believe that the system prepares children very well for entry into primary school. Comparison school teachers are more likely to believe this, and this difference is statistically significant.

Teachers from treatment and comparison schools are also in agreement that if the children do not learn, the blame falls on the teachers and the head teachers responsible for these children and not the Ministry of Education or local education officials. Some teachers believe that parents are principally responsible if children do not learn, and this belief is higher in treatment schools.

Table 17: Teacher Assessment of the Pre-Primary System

	Variable	Comparison	Treatment	Difference in Means
Assessment of Pre-Primary System				
(1)	System does not prepare children	0.00	0.03	-0.03
		(0.00)	(0.02)	(0.02)
(2)	System somewhat prepares children, but could be better	0.23	0.35	-0.13
		(0.05)	(0.06)	(0.08)
(3)	System prepares children very well	0.77	0.62	0.15**
		(0.05)	(0.05)	(0.08)
Who is Responsible if Children do not Learn?				
(4)	Parents	0.16	0.20	-0.04
		(0.05)	(0.05)	(0.08)
(5)	Teachers and head teachers	0.76	0.76	0.00
		(0.06)	(0.06)	(0.08)
(6)	Ministry of Education	0.05	0.03	0.02
		(0.03)	(0.02)	(0.03)
(7)	Local education officials (DEO/DIS/CCT)	0.03	0.01	0.02
		(0.02)	(0.01)	(0.03)
	N (Teachers Interviewed)	62	74	136

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 18 displays responses from teachers on their satisfaction and attitudes about their job. Teachers were given a 1 to 3 scale with a 1 equating to “Disagree”, 2 as “Neutral” and 3 as “Agree”; their responses are averaged across treatment and comparison. Most teachers in treatment and comparison schools are satisfied with their job and are neutral to the statement that they are overwhelmed with the amount of work that they have. Teachers in comparison schools are more likely to say that they feel they receive adequate support from their head teacher, and this is statistically significant. Teachers from both comparison and treatment schools are most likely to agree with the statement that children should all be able to read and write by the time that they finish pre-primary. This is balanced across treatment type.

Table 18: Teacher Job Satisfaction

	Variable	Comparison	Treatment	Difference in Means
(1)	I am satisfied with my job.	2.79	2.78	0.01
		(0.07)	(0.06)	(0.10)
(2)	I receive adequate support from my Head Teacher.	2.60	2.30	0.30*
		(0.10)	(0.12)	(0.16)

(3)	I am overwhelmed with the amount of work I have.	2.08	1.97	0.11
		(0.13)	(0.11)	(0.16)
(4)	I have adequate support and resources from the school to carry out my teaching.	2.37	2.31	0.06
		(0.12)	(0.10)	(0.15)
(5)	I feel the role of a pre-primary teacher is valued.	2.92	2.89	0.03
		(0.05)	(0.05)	(0.07)
(6)	I feel I have the training I need to be an effective pre-primary teacher.	2.26	2.47	-0.21
		(0.13)	(0.09)	(0.15)
(7)	I believe children should all be able to read and write by the time they finish pre-primary.	2.95	2.93	0.02
		(0.04)	(0.03)	(0.05)
(8)	Responding to the different needs of the children frustrates me when doing my work.	1.76	1.53	0.23
		(0.14)	(0.10)	(0.17)
	N (Teachers Interviewed)	62	74	136

*Notes: Reported values range from 1 to 3 where 1 = Disagree, 2 = Neutral, 3 = Agree. Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

The next table shows the proportion of teachers that agree with a range of statements concerning the management and support structures in their school. The majority of teachers in both treatment arms say that they cooperate with other teachers in the school in regard to lesson scheming, planning and identifying better ways to deliver lessons. Treatment teachers are significantly more likely than comparison school teachers to say that they cooperate in lesson planning. The most common response for who reviews these items is listed as the head teacher in both groups. Another common response is the "other" category and the deputy head teacher. Example of those who supervise from the "other" category is comprised of the following people: Head of Nursery, Director of Studies, Head of Infant, and supervisors from AKFU. Classroom observation of the teachers is typically done weekly, followed by monthly and then termly. Notably, almost 20 percent of teachers in both comparison and treatment groups state that they are only observed once per term. Comparison school teachers are more likely to say that a head teacher or someone else from management observes their teaching. This is a statistically significant difference of 14 percentage points.

Roughly 20 percent of teachers in both groups state that they missed at least one day of school in the week prior to being surveyed. Of those who said that they were absent, the average number of days that they missed was 2.29 days in comparison schools and 1.58 days in treatment schools. While this is not statistically significant, it is a difference of almost one day (out of 5 working days in a week).

Teachers were also asked if they are mentored by anyone else. Teachers for treatment schools are 14 percentage points more likely to say that they are mentored by another individual not previously mentioned. This is a significant difference. For the majority of individuals in both groups, this mentorship occurs on a termly basis and they are helped specifically with ECD in their classrooms. Treatment school teachers are more likely than comparison school teachers to say that the support that they were given is not adequate for their needs. Only half of the treatment school teachers believe that it is adequate, whereas 80 percent of comparison teachers on average think that their mentorship is adequate.

Nearly 80 percent of teachers in both treatment and comparison schools believe that they do not have the resources needed in order to teach. Teachers were asked which items they have available in their classrooms (desks, readers, writing paper, wall charts, etc.). For each of these items, less than one-fourth of the teachers state that they are available for children. This is fairly equal across treatment and comparison. However, treatment schools are more likely to have readers for their learners than the comparison schools.

Table 19: Support Structures within Schools

	Variable	Comparison	Treatment	Difference in Means
(1)	Do you cooperate with other teachers in lesson scheming and lesson planning?	0.73	0.86	-0.14**
		(0.05)	(0.04)	(0.07)
(2)	Do you cooperate with other teachers in lesson reviews to identify better ways to deliver your lesson?	0.74	0.76	-0.01
		(0.05)	(0.05)	(0.07)
Who is responsible for reviewing lesson plans and schemes of work?				
(3)	No one	0.05	0.01	0.03
		(0.03)	(0.01)	(0.03)
(4)	Head Teacher	0.48	0.57	-0.08
		(0.07)	(0.07)	(0.10)
(5)	Deputy Head Teacher	0.13	0.09	0.03
		(0.05)	(0.04)	(0.06)
(6)	Other(specify)	0.34	0.32	0.01
		(0.07)	(0.07)	(0.10)
How often are these items reviewed?				
(7)	Never	0.05	0.03	0.02
		(0.03)	(0.02)	(0.03)
(8)	Weekly	0.29	0.30	-0.01
		(0.06)	(0.06)	(0.09)
(9)	Every two weeks	0.11	0.05	0.06
		(0.04)	(0.03)	(0.05)
(10)	Monthly	0.18	0.19	-0.01
		(0.05)	(0.04)	(0.06)
(11)	Termly/ Quarterly	0.37	0.43	-0.06
		(0.07)	(0.06)	(0.09)
(12)	Does the Head Teacher or someone else in the management team observe you teaching?	0.92	0.78	0.14**
		(0.04)	(0.05)	(0.07)
How often are you observed?				
(13)	Weekly	0.47	0.48	-0.01
		(0.07)	(0.06)	(0.09)
(14)	Monthly	0.33	0.31	0.02
		(0.06)	(0.06)	(0.09)
(15)	Termly/Quarterly	0.18	0.19	-0.01
		(0.05)	(0.05)	(0.07)
(16)	Don't Know	0.02	0.02	0.00
		(0.02)	(0.02)	(0.02)
(17)	Does the Head Teacher give teachers suggestions as to how you can improve your teaching?	0.84	0.78	0.05
		(0.05)	(0.05)	(0.07)
Teacher Absenteeism				
(18)	Have you missed school in the last week?	0.23	0.16	0.06
		(0.06)	(0.04)	(0.07)
(19)	How many times have you missed school in the last week?	2.29	1.58	0.70
		(0.42)	(0.17)	(0.45)
Mentorship				
(20)	Does anyone else visit you at school to provide mentorship and support you?	0.24	0.38	-0.14*
		(0.06)	(0.05)	(0.08)
(21)	Mentorship frequency: Every two weeks	0.13	0.11	0.03
		(0.09)	(0.06)	(0.11)
(22)	Mentorship frequency: Monthly	0.27	0.39	-0.13
		(0.13)	(0.10)	(0.16)
(23)	Mentorship frequency: Termly	0.60	0.50	0.10
		(0.14)	(0.11)	(0.17)
(24)	Does your mentor support you in early childhood development in your classroom?	0.67	0.79	-0.12

		(0.12)	(0.07)	(0.14)
(25)	Was the support you were given adequate?	0.80	0.50	0.30*
		(0.14)	(0.10)	(0.17)
Teaching Resources				
(26)	Do you have sufficient resources in your classroom to teach?	0.23	0.20	0.02
		(0.06)	(0.05)	(0.07)
(27)	Chalk for learners	0.19	0.18	0.02
		(0.05)	(0.04)	(0.07)
(28)	Chalkboard	0.23	0.20	0.02
		(0.06)	(0.05)	(0.07)
(29)	Exercise books/writing paper	0.19	0.18	0.02
		(0.05)	(0.04)	(0.07)
(30)	Desks for learners	0.16	0.16	0.00
		(0.05)	(0.04)	(0.07)
(32)	Readers for learners	0.15	0.05	0.09*
		(0.04)	(0.03)	(0.05)
(34)	Toys	0.13	0.12	0.01
		(0.04)	(0.04)	(0.06)
(35)	Wall charts/pictures	0.24	0.19	0.05
		(0.06)	(0.05)	(0.07)
(36)	Wall clock	0.05	0.04	0.01
		(0.03)	(0.02)	(0.03)
	N (Teachers Interviewed)	62	74	136

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

The following table is a list of self-reported behavior by teachers, some of which has crossover with the classroom observation analysis, allowing us to get a more objective measurement of these behaviors. The majority of teachers' state that they assess the children in their class. Forty percent of teachers report that they are in possession of a copy of the national curriculum.

Over half of the teachers say that both Luganda and English are used in tandem as the languages of instruction (LOI) in the classroom. In comparison schools, the next most common LOI is 'Luganda only' and then 'English only' follows that. This is in contrast to the treatment schools in which 'English only' is more prevalent than 'Luganda only'.

Another self-reported behavior that we collected data on was around the punishment of learners. Comparison teachers are 24 percentage points more likely to state that they engage in physical punishment with their learners. This is highly statistically significant. Although there is a smaller number for treatment teachers, there are still 16 percent of teachers who admit to physically punishing the children that they teach. Most commonly however, children are given a verbal reprimand by their teachers; some teachers say that they redirect the attention of the child to an appropriate activity. Interestingly, although more comparison school teachers say that they engage in physical punishment, a very high number of them say that they know what child protection is, and this number is higher for comparison teachers than for treatment teachers. In the "other" category for punishment, four different teachers (3 treatment and 1 comparison) state that they use the "Same Upon You" song to punish children. The "Shame Upon You" song goes something like this, "Shame, shame, shame, shame upon you, a big boy/girl. Like a monkey, like a pussycat, uwo, uwo, uwo." This song is done with children making claw like shapes with the fingers in both hands and directing them at the shamed child, at the same time singing while making faces at this child.

Other teachers mention that they require children to stand and squat in class as punishment (3 treatment and 1 comparison). One treatment school teacher says that they require misbehaving children to sit with the teacher, distribute their food to the other pupils, or they tell the rest of the class to laugh at them. Each of these methods is potentially problematic and should be referenced in future trainings with these teachers. More positive methods that teachers state include telling learners to apologize to whoever they have wronged, changing seating, and inviting their parents to find a solution if the offense is a serious one. Seven teachers

state that there is no punishment for pre-primary children, they are just counselled when negative behavior occurs (3 treatment and 4 comparison).

Table 20: Teacher Self-Reported Behaviors

	Variable	Comparison	Treatment	Difference in Means
(1)	Do you assess the children in your class?	0.94	0.91	0.03
		(0.03)	(0.03)	(0.04)
(2)	Do you have a copy of the national curriculum?	0.34	0.41	-0.07
		(0.07)	(0.06)	(0.09)
Language of Instruction				
(3)	English/Luganda	0.52	0.50	0.02
		(0.07)	(0.06)	(0.10)
(4)	Luganda	0.24	0.16	0.08
		(0.06)	(0.04)	(0.08)
(5)	English	0.19	0.30	-0.10
		(0.05)	(0.06)	(0.08)
(6)	Other (specify)	0.03	0.04	-0.01
		(0.03)	(0.03)	(0.04)
(7)	Don't know	0.02	0.00	0.02
		(0.02)	(0.00)	(0.02)
Estimated Time Spent on Daily Activities (in hours)				
(8)	Teaching Children	3.32	3.18	0.14
		(0.22)	(0.20)	(0.30)
(9)	Involving children in playing activities	1.21	1.33	-0.12
		(0.11)	(0.11)	(0.15)
(10)	Preparing for lessons	1.21	1.36	-0.15
		(0.13)	(0.14)	(0.19)
(11)	Administrative work in school	1.37	2.19	-0.83*
		(0.26)	(0.35)	(0.43)
Punishment of Children (Selection all that apply)				
(12)	Physical punishment	0.40	0.16	0.24***
		(0.07)	(0.04)	(0.08)
(13)	Verbal reprimand	0.58	0.58	0.00
		(0.07)	(0.07)	(0.09)
(14)	Removed from the class/ timeout	0.08	0.14	-0.05
		(0.04)	(0.05)	(0.06)
(15)	Redirected to appropriate activities	0.18	0.24	-0.07
		(0.05)	(0.05)	(0.07)
(16)	Other(specify)	0.19	0.34	-0.14*
		(0.06)	(0.06)	(0.08)
Child Protection				
(17)	Do you know what child protection is?	0.94	0.88	0.06
		(0.03)	(0.05)	(0.05)
	N (Teachers Interviewed)	62	74	136

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

The next section on Teacher Training describes the amount of training that teachers have had, the topics covered in the training and the organizations that give these trainings. It should be noted that teachers from treatment schools attended a training from AKFU in January of this year (2018); therefore we would expect that that treatment teachers have higher rates of training attendance than comparison school teachers, and they do. Comparison teachers are 18 percentage points more likely to say that they have attended a service training in the past 12 months. In addition, treatment teachers are 14 percentage points more likely to have gone for more than 5 days of training. Both of these differences are statistically significant. That being said, there is still a group of 36 percent of teachers from treatment schools who state that they have not been for a training within the past year. The next two tables below break this down further.

There are 27 treatment school teachers who say that they have not been to any training in the past 12 months and 47 teachers who say that they have been to at least four days of training. Of the 47 teachers who had been

to any training (AKFU or otherwise), 27 of these teachers say that this was not an AKFU sponsored training. Only 20 out of the 74 total teachers interviewed state that they have been trained in the past 12 months *and* that this training came from AKFU. That means that 72.9 percent of the total treatment teachers that were interviewed say that they have not been trained by AKFU, even though there was a training in January 2018.

27 out of 74 teachers say that they have not received any training in the past 12 months (AKFU or otherwise), while 47 state that they have received some training. Of these 47 teachers, only 20 state that this training came from AKFU. Therefore, of the total number of teachers interviewed (74), only 20 state that they received a training from AKFU. The other 27 teachers who received some training either did not know what organization was offering the training or they stated that the training came from an organization other than AKFU.

Table 21: Trainings Attended in the Past 12 Months by Treatment Teachers

District	No	Yes, 4-5 days	Yes, more than 5 days	Total
Kampala	8	8	3	19
Mukono	12	9	9	30
Wakiso	7	9	9	25
N (Teachers Interviewed)	27	26	21	74

Table 22: AKFU Trainings Attended by Treatment Teachers

District	No	Yes	Total
Kampala	10	1	11
Mukono	9	9	18
Wakiso	8	10	18
N (Teachers Interviewed)	27	20	**47**

It will require further information from AKFU to understand whether or not this was an intentional act in which only certain teachers were invited for the training, but we are unable to comment on that at this time. In order to comment on this, we need more information on the teachers that were invited to the training and from what classes and districts. In addition, it could be that teachers do not know which organization sponsored the training that they attended. This was a relatively small number: only four teachers said that they did not know who gave the training, but we cannot assume that this must mean that they attended an AKFU training. A final theory could be that there has already been turnover in these teachers and that some trained teachers have moved to other schools. AKFU should have the data to inform whether or not this is a possibility.

Of those that did attend a recent training, teachers were asked about the main topics of the training and reported all that applied. The top three themes were the following: the learning framework for early childhood, the caregiver's guide to the learning framework for ECD and the national ECD policy. Comparison school teachers are more likely to say that they learned about the curriculum for pre-primary and P1 to P3, while treatment teachers are more likely to say that they learned about the learning framework for early childhood, the caregiver's guide to the learning framework for ECD and the national ECD policy. Some teachers also report learning about child protection. This is higher in treatment schools than comparison schools. Forty-three percent of treatment teachers say that this training came from AKFU, while 7 percent of comparison school teachers also state this. It is unclear why the comparison school teachers believe that they received a training from AKFU. It is possible that they merely guessed who had conducted the training, as we see that 14 percent of teachers in comparison schools do not know who gave the training.

Comparison school teachers state that they would like more help in all of the listed areas; using the curriculum and assessing children's development were the most important areas for them. According to their responses, they feel the most comfortable with teaching numeracy. Treatment school teachers have a clear preference for wanting help in teaching literacy, and this is statistically different from the comparison teachers. For the comparison school teachers about one-fourth of teachers want help in the following areas: classroom management, record keeping, teaching young children and assessing children's development.

Finally, teachers are asked what documents they have that support their teaching. Enumerators were instructed to insist that teachers show them proof that this record exists before marking so on the survey. Therefore, these responses have been verified. There are two instances in which treatment school teachers are more statistically likely to have a document than comparison school teachers. This is in regards to the schemes of work and the teacher's file. Of the record keeping documents, teachers are most likely to have an attendance record book, but not very likely to have an assessment records book for the learners, nor did the majority have profiles for the children.

Table 23: Teacher Training

	Variable	Comparison	Treatment	Difference in Means
Service Training in the Past 12 Months				
(1)	No	0.55	0.36	0.18**
		(0.07)	(0.06)	(0.09)
(2)	Yes, 4-5 days or less of training/ workshops	0.31	0.35	-0.04
		(0.07)	(0.06)	(0.09)
(3)	Yes, more than 5 days of training/ workshops	0.15	0.28	-0.14*
		(0.05)	(0.06)	(0.08)
If yes, what were the main topics? (Select all that apply)				
(4)	Curriculum for Pre-Primary	0.29	0.21	0.07
		(0.07)	(0.07)	(0.10)
(5)	Thematic Curriculum for P1 to P3	0.11	0.04	0.06
		(0.06)	(0.03)	(0.07)
(6)	The Learning Framework for Early Childhood	0.39	0.60	-0.20
		(0.10)	(0.08)	(0.12)
(7)	Caregiver's Guide to the Learning Framework for Early Childhood	0.25	0.43	-0.18
		(0.08)	(0.08)	(0.11)
(8)	Early Childhood Development Policy	0.29	0.45	-0.16
		(0.10)	(0.07)	(0.12)
(9)	Child protection	0.11	0.17	-0.06
		(0.06)	(0.05)	(0.08)
Who conducted this training? (Select all that apply)				
(10)	Aga Khan Foundation	0.07	0.43	-0.35***
		(0.07)	(0.08)	(0.11)
(11)	Community-based organization	0.04	0.09	-0.05
		(0.04)	(0.05)	(0.06)
(12)	NGO (not AKFU)	0.21	0.13	0.09
		(0.09)	(0.04)	(0.10)
(13)	Ministry of Education	0.18	0.23	-0.06
		(0.07)	(0.07)	(0.10)
(14)	Don't know/ No response	0.14	0.09	0.06
		(0.07)	(0.04)	(0.08)
In which areas would you like more help? (Select all that apply)				
(15)	Classroom management	0.13	0.24	-0.11
		(0.05)	(0.05)	(0.07)
(16)	Record keeping	0.16	0.24	-0.08
		(0.05)	(0.05)	(0.07)
(17)	Teaching young children	0.18	0.26	-0.08
		(0.06)	(0.05)	(0.08)
(18)	Using the curriculum	0.21	0.22	-0.01
		(0.06)	(0.05)	(0.08)
(19)	Assessing children's development	0.21	0.24	-0.03
		(0.05)	(0.05)	(0.07)
(20)	Literacy	0.19	0.41	-0.21***
		(0.06)	(0.05)	(0.08)
(21)	Numeracy	0.08	0.12	-0.04
		(0.03)	(0.04)	(0.05)
Do you have the following documents to support your teaching?				
(22)	Lesson plans	0.69	0.81	-0.12
		(0.06)	(0.06)	(0.09)

(23)	Schemes of Work	0.74	0.88	-0.14*
		(0.06)	(0.04)	(0.07)
(24)	Child assessment records book	0.31	0.34	-0.03
		(0.06)	(0.06)	(0.09)
(25)	Child attendance register	0.89	0.85	0.04
		(0.05)	(0.05)	(0.07)
(26)	Teacher's file (personal file)	0.27	0.49	-0.21**
		(0.06)	(0.06)	(0.08)
(27)	Children's admission records	0.34	0.31	0.03
		(0.07)	(0.06)	(0.09)
(28)	Children's work and important information about the child (e.g. child profile)	0.32	0.28	0.04
		(0.06)	(0.06)	(0.09)
	N (Teachers Interviewed)	62	74	136

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

The 74 treatment school teachers were asked additional questions about the benefits that they have received thus far from AKFU. The majority of teachers say that the benefit that they have received is training. There are also large numbers of teachers that state that they have benefitted from teaching and learning materials. Teachers state these materials as being pencils and books from the Madrasa program. Only 8 percent of teachers state that they have had a lesson observed by AKFU. The open responses say that Madrasa observes lessons and gives feedback on how to improve their teaching. In the "other" category teachers add that they have learned how to make materials using the local environment, improve their lesson scheming and receive help from AKFU in sponsoring their professional education.

Table 24: Perceived Teacher Benefits of AKFU Program

	Variable	Mean Treatment
(1)	*None*	27.03%
		(0.44)
(2)	*Training*	43.24%
		(0.50)
(3)	*Teaching and Learning Materials*	20.27%
		(0.40)
(4)	*Classroom Observation and Feedback*	8.11%
		(0.27)
(5)	*Other*	32.43%
		(0.47)
	N (Teachers Interviewed)	74

*Notes: Sample size for Treatment teachers is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Teachers state in the open-ended questions that they believe the resources or training they have received from Aga Khan have improved their teaching in several areas. A selection of these responses is below:

- Better socialization with learners;
- Ability to identify children's behavior and know who is not well on a particular day;
- Make appropriate lesson plans and schemes of work using the format given during the training;
- Improved teaching skills that incorporate play into learning so that both occur at the same time;
- Knowing how to assess learners;
- Have opportunities to knowledge with other pre-primary teachers to help them with their teaching;
- Giving learners time to play;
- Emphasize the use of mother tongue; and
- Improve the classroom sitting arrangement, classroom management and methods for teaching different class sizes.

Teachers state that they have used the materials provided to them by AKFU and that the materials have helped to make their learners more active. In addition, they say that the wall charts help with creating a friendly learning environment for the children, and as a result the children are showing more interest in learning.

These teachers were also asked what they think they are applying the least from the AKFU training. A selection of teachers say that they do not know what to do with regards to the use of the books. One common theme is that teachers state that they lack the materials they need in order to do the activities that they were taught in the training. One teacher says that they are unable to use books because there are no materials with which to make the books and it is expensive. Another says that they cannot paint the boxes as they were taught because they have not gotten the money yet. A third teacher says that they do not conduct outdoor activities because there is not a playground or swings to play on. Teachers also report that record keeping and keeping track of children's progress is a topic that they are applying the least from the training.

Finally, teachers were asked what they think can be improved from AKFU's training and support. A selection of the most common responses has been edited for clarity and appears below.

How to improve AKFU's training and support:

- Sensitize and train parents and school administrators about ECD.
- Provide play material like slates, dolls, tires, ropes, swings and slides for outdoor programs since the schools do not have them.
- There is no time for teachers to make materials since they are too engaged already. Even during the holidays they have to attend training.
- Include upgrading to Diploma level in the training sessions.
- Give individual tests and assessments in order to know whether they have attained the qualifications in applying these skills.
- Teach some other areas that have not been taught, like the music corner and instruments.
- Give more training on how to make schemes and lesson plans since it was not yet mastered properly.
- Give more instruction on how to prepare learner files.
- Review how to do the daily child assessment and mid-term assessment provided by AKFU.
- Increase the duration of the training to enable teachers to achieve more.
- Plan the training better and include more engagement with open discussions.
- Do not train only from Kampala, but also go to other districts since people may be willing to study but have no money to travel to Kampala for the course.
- Teach more about literacy since it helps teachers to learn letter sounds and writing (word formation). If a child is taught how to sound letters it will be easy for the child to read words.

Classroom Observation

Classroom observations were conducted for 56 teachers in comparison school classrooms and 67 teachers in treatment school classrooms. The majority of these teachers are female and slightly more likely to be from the Baby class than the Middle class. This is true more so for the comparison school teachers, where close to 60 percent of the observations come from the Baby class. Comparison schools are more likely to not have a Middle class, and therefore the observations that were done disproportionately favor the Baby class. The average lesson duration for both groups is around 30 minutes. The school day lasts an average of five hours from 8:00am to 1:00pm; some schools close at 12:00pm. There are roughly 12 boys and 12 girls present in each class in comparison and treatment schools. The majority of schools have one or more teachers present in the classroom for an average of a little more than one teacher per class.

In regards to gender participation, our observers find that teachers call on boys and girls equally and encourage the active participation of all girls and boys. The majority of teachers do not cover any topics related to diversity during their classroom lessons.

Table 25: Classroom Composition, Participation by Gender and Use of Materials on Diversity

	Variable	Comparison	Treatment	Difference in Means
(1)	Gender (Female)	0.96	0.99	-0.02
		(0.02)	(0.01)	(0.03)
(2)	Baby Class	0.61	0.52	0.08*
		(0.04)	(0.02)	(0.05)
(3)	Middle Class	0.39	0.48	-0.08*
		(0.04)	(0.02)	(0.05)
(4)	Lesson duration during observation (in minutes)	30.57	32.13	-1.56
		(1.39)	(1.55)	(2.10)
(5)	Number of boys present	12.34	11.58	0.76
		(1.16)	(1.19)	(1.66)
(6)	Number of girls present	11.54	10.57	0.97
		(1.11)	(1.27)	(1.68)
(7)	Number of teachers present in the classroom and working with children?	1.11	1.19	-0.09
		(0.06)	(0.08)	(0.10)
Equal Gender Participation				
(8)	Encourages stereotypic activities (has only boys race or play)	0.00	0.03	-0.03
		(0.00)	(0.02)	(0.02)
(9)	Teacher calls upon or interacts with one gender more than another	0.04	0.03	0.01
		(0.02)	(0.02)	(0.03)
(10)	Teacher calls upon and interacts with girls and boys equally	0.29	0.39	-0.10
		(0.06)	(0.08)	(0.10)
(11)	Teacher encourages active participation of all children across all activities	0.68	0.55	0.13
		(0.06)	(0.08)	(0.10)
Diversity, Teacher Provides:				
(12)	Stereotypic materials or ideas about ethnic/religion	0.04	0.01	0.02
		(0.02)	(0.01)	(0.03)
(13)	No materials or discussion about ethnic or religious groups	0.89	0.91	-0.02
		(0.05)	(0.03)	(0.05)
(14)	Some materials, such as books and music, so children learn about diversity	0.07	0.03	0.04
		(0.03)	(0.02)	(0.04)
(15)	Materials and discussion of diversity and different people (by showing how they talk, celebrate).	0.00	0.04	-0.04*
		(0.00)	(0.02)	(0.02)
	N (Teachers Observed)	56	67	123

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Classroom infrastructure appears to be better in the treatment schools, but this is only statistically different across one dimension. In treatment schools, 60 percent of children are able to access materials from learning corners versus only 36 percent in the comparison schools. Treatment school children are also more likely to be able to access a school yard with enough space for playing. In general, most classrooms have enough infrastructure where children are able to have a seat and access a writing surface. However, space is limited and not all children have the room that they need in order to participate in indoor activities.

Table 26: Classroom Infrastructure

	Variable	Comparison	Treatment	Difference in Means
(1)	Classroom space is enough for all attending children to do all indoor activities	0.59	0.60	-0.01
		(0.08)	(0.07)	(0.11)
(2)	All children have a seat and access to a writing surface that are appropriately	0.82	0.85	-0.03
		(0.06)	(0.06)	(0.08)
(3)	Children access materials that are organized into learning corners	0.36	0.57	-0.21**
		(0.07)	(0.06)	(0.10)
(4)	School yard has adequate space for play and some equipment for gross motor activities	0.46	0.60	-0.13
		(0.08)	(0.08)	(0.12)
	N (Teachers Observed)	56	67	123

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 27 presents what the enumerators observed in classrooms in regards to what opportunities teachers gave to develop skills specific skills such as numeracy and literacy and what methods they employed to do so. Answers range from a value of 0 to 3 where 0 = Does not occur, 1 = Taught using repetition only, 2 = Taught using one element of play-based learning, and 3 = Taught using two or more elements of play-based learning. Elements of play-based learning include: 1) teachers encouraging children to directly engage with materials; 2) giving children some choice in their activities and use of materials; and 3) involving children in discussions that extend their understanding of the concepts being taught. Hence, the values listed for each variable are an average of these scores for all of the teachers. None of the teachers engage the learners in two or more elements of play-based learning for the tasks listed. In fact, the most common method of engaging learners is through repetition. In particular, this is used for numeracy, literacy and gross motor activities. Some activities are reported not to happen very often. This is true on average for storybook reading and activities that promote free play. The tasks most likely to include play-based learning are music and movement activities, expressive language skills, and for comparison school classrooms, fine motor skills. However, treatment schools are 32 percentage points less likely to implement activities that develop fine motor skills.

Table 27: Opportunities for Children to Develop Skills in the Classroom

	Variable	Comparison	Treatment	Difference in Means
(1)	Learning opportunities to support development of numeracy skills	1.18	1.25	-0.08
		(0.10)	(0.13)	(0.16)
(2)	Learning opportunities to support development of literacy skills	0.71	0.99	-0.27
		(0.12)	(0.13)	(0.17)
(3)	Learning opportunities to develop expressive language skills	1.18	1.31	-0.13
		(0.12)	(0.15)	(0.19)
(4)	Learning opportunities to promote fine motor skills	1.39	1.07	0.32*
		(0.13)	(0.14)	(0.19)
(5)	Learning opportunities that allow children to engage in gross motor activities	1.02	1.22	-0.21
		(0.13)	(0.12)	(0.18)
(6)	Teacher reads an age-appropriate storybook with text and pictures to support listening	0.09	0.15	-0.06
		(0.05)	(0.06)	(0.08)
(7)	Learning activities that promote free play or open choice	0.57	0.58	-0.01

		(0.11)	(0.12)	(0.16)
(8)	Learning opportunities that allow children to engage in music/ movement activities	1.39	1.40	-0.01
		(0.13)	(0.12)	(0.17)
	N (Teachers Observed)	56	67	123

*Notes: Reported values range from 0 to 3 where 0 = Does not occur, 1 = Taught using repetition only, 2 = Taught using ONE element of play-based learning, and 3 = Taught using TWO OR MORE elements of play-based learning. Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Comparison teachers are more likely to mention the theme of the lesson to learners and to make connections to an activity. However, treatment teachers are more likely to take it a step further and additionally reflect on the theme with children after mentioning it and connecting it to an activity. This is highly statistically significant. Comparison teachers are 11 percentage points more likely to have a portfolio for each child in their classroom. On the other hand, teachers from treatment schools are 12 percentage points more likely to track the development of their learners. Around 70 percent of both treatment and comparison teachers used the curriculum during classroom observation. Of the topics mentioned, teachers cover numeracy the most; treatment teachers are 16 percentage points more likely to cover this topic. Treatment school teachers also cover art, health and social-emotional health at similar rates of around 40 percent. Comparison school teachers cover each of these topics less at a rate of around 25 percent for each.

Table 28: Teacher Actions in the Classroom

	Variable	Comparison	Treatment	Difference in Means
Theme of the Lesson				
(1)	No mention of theme	0.21	0.27	-0.05
		(0.06)	(0.05)	(0.08)
(2)	Mentions theme, but does not draw attention to the theme during activities	0.18	0.24	-0.06
		(0.05)	(0.05)	(0.07)
(3)	Mentions theme and makes connections to an activity	0.55	0.30	0.26***
		(0.07)	(0.06)	(0.09)
(4)	Mentions theme, connects it to an activity, and reflects on the theme with children	0.05	0.19	-0.14**
		(0.03)	(0.05)	(0.06)
Tracking Learning				
(5)	Each child has their own portfolio	0.38	0.27	0.11
		(0.08)	(0.06)	(0.10)
(6)	Teacher tracks children development	0.38	0.49	-0.12
		(0.07)	(0.08)	(0.11)
Individualized Instruction				
(7)	No awareness of individual needs	0.16	0.36	-0.20**
		(0.05)	(0.06)	(0.08)
(8)	Some awareness of individual needs	0.29	0.24	0.05
		(0.06)	(0.05)	(0.08)
(9)	Notices individual needs	0.46	0.33	0.14
		(0.07)	(0.06)	(0.09)
(10)	Knows individual needs	0.09	0.07	0.01
		(0.04)	(0.03)	(0.05)
Curriculum				
(11)	Is a curriculum used?	0.70	0.69	0.01
		(0.07)	(0.07)	(0.10)
What topics are covered? (Select all that apply)				
(12)	Literacy	0.61	0.79	-0.18*
		(0.08)	(0.06)	(0.09)
(13)	Numeracy	0.64	0.81	-0.16*
		(0.06)	(0.06)	(0.09)
(14)	Art	0.25	0.39	-0.14

		(0.07)	(0.07)	(0.09)
(15)	Health	0.27	0.40	-0.14
		(0.06)	(0.08)	(0.10)
(16)	Social-emotional	0.27	0.45	-0.18*
		(0.07)	(0.08)	(0.10)
(17)	Other(specify)	0.30	0.10	0.20**
		(0.07)	(0.04)	(0.08)
	N (Teachers Observed)	56	67	123

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

The next table provides information on what classroom materials are available for children to use. The first six items on this table are based on the average of values from 0 to 2 across all of the categories, where 0 = No materials present, 1 = Materials present but children do not use, and 2 = Children use. Treatment school classrooms are also more likely to have learning materials available in the classroom for the children. This is significantly so for fantasy play materials, blocks, educational toys/numeracy materials and for storybooks. At least some of this difference is likely attributable to the training that the AKFU teachers received in January prior to the start of the term (and prior to the baseline). In the teacher interviews teachers report that they were taught how to make some books and received some materials from AKFU. In both treatment and comparison schools, teachers are most likely to have writing utensils available and use them. The item least likely to be present and utilized in both treatment and comparison schools is storybooks.

In addition, we found zero books in any classroom that were in the local language, Luganda. This is troublesome because research shows that it is important for children to learn in the local language in the early years before transitioning to learning in English. Furthermore, 80 percent of the classrooms observed in treatment schools did not have any books in English, either. The classrooms which had books were likely to fall into the range of 1 to 14 books. Only 5 percent of teachers had over 14 books in treatment schools.

Table 29: Availability of Classroom Materials

	Variable	Comparison	Treatment	Difference in Means
(1)	Writing utensils (pencils, pens, crayons, chalk)	1.77	1.82	-0.05
		(0.07)	(0.06)	(0.09)
(2)	Art (Paper, crayons, markers, chalk, pencils, paints, clay, sand, scissors, tape)	1.25	1.21	0.04
		(0.12)	(0.13)	(0.18)
(3)	Fantasy play (Dolls, stuffed animals, dress up clothes, masks, pretend food)	0.34	0.97	-0.63***
		(0.09)	(0.12)	(0.14)
(4)	Blocks (wooden or plastic blocks, interlocking pieces)	0.14	0.63	-0.48***
		(0.06)	(0.12)	(0.14)
(5)	Educational Toys or Numeracy Materials (bottle caps, dice, water, beads, rocks)	0.62	1.06	-0.43**
		(0.13)	(0.11)	(0.17)
(6)	Storybooks (books with pictures and text, including those made by the teacher)	0.18	0.42	-0.24*
		(0.07)	(0.10)	(0.12)
Number of Books (Local language, Luganda)				
(7)	None	1.00	1.00	0.00
		(0.00)	(0.00)	(0.00)
Number of Books English				
(8)	None	0.89	0.81	0.09
		(0.05)	(0.06)	(0.08)
(9)	1-14	0.07	0.13	-0.06
		(0.04)	(0.05)	(0.07)
(10)	15-24	0.00	0.04	-0.04
		(0.00)	(0.03)	(0.03)
(11)	25+	0.04	0.01	0.02
		(0.04)	(0.01)	(0.04)

N (Teachers Observed)	56	67	123

*Notes: For Items 1 through 6 the reported values range from 0 to 2 where 0 = No materials present, 1 = Materials present but children do not use, and 2 = Children Use. Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 30 presents the behaviors that teachers exhibited during their observation by an enumerator. While it is likely that being observed causes teachers to change their behavior, we largely expect that this occurs equally across treatment and comparison teachers. Under this assumption, the absolute differences between treatment and comparison schools remains accurate and useful. In general, we see that most teachers appear to enjoy teaching and being around children either some or most of the time. There are some incidences of negative physical and verbal interaction with the learners, and this is fairly equal across both treatment and comparison school teachers. Comparison school teachers are more likely to redirect the attention of the children and this difference is significant. However, treatment school teachers are more likely to employ other positive techniques. Enumerators report that negative verbal or physical actions occur rarely or not at all.

For the most part children are engaged during the observations, but nearly all teachers leave the children inactive for periods of ten minutes or more with no specific activity. In group formation with the children, most teachers employ 2 groups or no group and the whole class works together. Comparison school teachers are more likely to employ three groups and this is statistically significant. Children are well supervised by the teachers and there are very few cases in which children are left alone for more than 5 minutes.

Table 30: Behaviors Exhibited by Teachers

	Variable	Comparison	Treatment	Difference in Means
Teacher Emotional Display				
(1)	Teacher has clear negative emotions	0.00	0.03	-0.03
		(0.00)	(0.02)	(0.02)
(2)	Teacher has neutral or disengaged emotions	0.12	0.12	0.01
		(0.05)	(0.04)	(0.07)
(3)	Teacher appears to enjoy children and teaching sometimes	0.34	0.33	0.01
		(0.06)	(0.06)	(0.09)
(4)	Teacher appears to genuinely enjoy teaching	0.54	0.52	0.01
		(0.07)	(0.07)	(0.10)
(5)	Negative physical interaction	0.05	0.07	-0.02
		(0.03)	(0.03)	(0.04)
(6)	Negative verbal interaction	0.12	0.12	0.01
		(0.05)	(0.04)	(0.07)
(7)	Redirects attention	0.57	0.36	0.21**
		(0.07)	(0.07)	(0.10)
(8)	Positive techniques	0.30	0.52	-0.22**
		(0.06)	(0.08)	(0.10)
Frequency of Negative Verbal and Physical Actions				
(9)	Frequently (5 or more times)	0.07	0.01	0.06
		(0.04)	(0.01)	(0.04)
(10)	Sometimes (3-4 times)	0.07	0.09	-0.02
		(0.04)	(0.03)	(0.05)
(11)	Rarely (1-2 times)	0.16	0.19	-0.03
		(0.05)	(0.05)	(0.07)
(12)	Never (0 times)	0.70	0.70	-0.01
		(0.07)	(0.06)	(0.09)
Child Engagement				
(13)	Few children are engaged for most of the observation	0.04	0.09	-0.05
		(0.02)	(0.03)	(0.04)
(14)	Some children are engaged for most of the observation	0.16	0.18	-0.02

		(0.05)	(0.05)	(0.07)
(15)	Most children are engaged for most of the observation	0.39	0.36	0.03
		(0.07)	(0.06)	(0.09)
(16)	All children are engaged for most of the observation	0.41	0.37	0.04
		(0.07)	(0.07)	(0.10)
(17)	Children wait 10 minutes or more with no specific activity.	0.95	0.96	-0.01
		(0.03)	(0.03)	(0.04)
Group Activities				
(18)	All learning activities are done in whole group (entire class).	0.25	0.27	-0.02
		(0.06)	(0.06)	(0.09)
(19)	Two grouping types are used during the observation	0.55	0.70	-0.15
		(0.07)	(0.07)	(0.09)
(20)	Three grouping types are used during the observation	0.11	0.01	0.09**
		(0.04)	(0.01)	(0.04)
(21)	All four groupings are formed throughout the observation	0.09	0.01	0.07*
		(0.04)	(0.01)	(0.04)
Supervision of Children				
(22)	Children left alone > 10 mins	0.04	0.00	0.04
		(0.02)	(0.00)	(0.02)
(23)	Children left alone 5 to 10 mins	0.02	0.01	0.00
		(0.02)	(0.01)	(0.02)
(24)	Children left alone < 5 mins	0.05	0.16	-0.11**
		(0.03)	(0.05)	(0.06)
(25)	Children never left alone	0.89	0.82	0.07
		(0.05)	(0.05)	(0.07)
	N (Teachers Observed)	56	67	123

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

4.4 Baseline Equivalency Tests for Children

In this baseline evaluation, there were 21 subtasks that were used to test children for school readiness in both treatment and comparison schools. Regressions were run on each of the 21 tasks to determine if there was a statistical difference between the performance of children in the treatment and comparison schools at baseline. The results of these regressions are shown in Table 31 below. The variable column shows all of the 21 subtasks that were tested, while the second column shows the mean score for comparison schools and the third column shows the mean for the treatment schools. The fourth column shows the comparison mean less the treatment mean. Since these subtasks are measured as proportion out of 100, the values in this column represent the difference in proportions between the two treatment arms. For example, row 1 shows the results for the Copying a Shape subtask; the value is 0.83, meaning that there is a 0.83 percentage point difference in the scores of children in treatment schools and those in comparison schools.

The differences between the treatment and comparison schools across these sub-tasks are small. Following the convention of social science literature, stars are used to indicate significance. Throughout this report we have used 1 star to indicate a significance of 10% (p-value = .1), 2 stars for 5% (p-value = .05), and 3 stars for 1% (p-value = .01). A p-value of .1 or 10% means that there is a 10% chance that the difference between the two treatment arms is due to random chance. Therefore, a smaller p-value (larger number of stars) means that it is more likely that we can say that the difference between treatment and comparison is *not* due to random chance, but rather to some inherent difference between the two.

In this case, we do not want there to be a significant difference between the treatment and comparison schools because this is a baseline evaluation and it is important that the starting values for these children be as similar as possible. The regressions in Table 31 do not show any stars on the values in the Difference column because there is no statistical difference between the treatment and comparison schools across all of the sub-tasks. This

is a strong indication that the baseline assignment of comparison to treatment schools is clean and unbiased in overall task performance.

Table 31: Sub-task Means and Difference in Means Across Comparison and Treatment

	Variable	Comparison	Treatment	Difference
Motor Skills (Gross and Fine)				
(1)	Copying a shape	63.92	63.08	0.83
		(2.38)	(1.79)	(2.95)
(2)	Draw a person	55.20	57.25	-2.05
		(1.67)	(1.54)	(2.26)
(3)	Hopping	71.09	74.66	-3.57
		(2.02)	(2.07)	(2.83)
Early Literacy				
(4)	Expressive vocabulary	30.50	30.32	0.18
		(1.23)	(1.25)	(1.71)
(5)	Print awareness	31.87	30.27	1.61
		(2.17)	(1.48)	(2.61)
(6)	Letter identification	9.50	7.66	1.83
		(1.46)	(1.21)	(1.88)
(7)	Letter Sounds	11.53	9.80	1.74
		(1.15)	(1.02)	(1.54)
(8)	Writing	55.90	57.90	-2.00
		(1.75)	(1.61)	(2.38)
(9)	Oral comprehension	19.44	19.23	0.21
		(0.99)	(1.09)	(1.47)
Early Numeracy				
(10)	comparison of size and length	78.89	79.36	-0.47
		(1.13)	(1.34)	(1.76)
(11)	Sorting and classification	23.09	21.15	1.94
		(1.62)	(1.60)	(2.27)
(12)	Shape identification	48.27	49.14	-0.87
		(1.89)	(1.55)	(2.43)
(13)	Number identification	12.21	12.51	-0.30
		(1.26)	(1.16)	(1.67)
(14)	One to one correspondence	19.73	18.77	0.96
		(1.46)	(1.24)	(1.93)
(15)	Simple operation	32.49	31.73	0.76
		(1.56)	(1.40)	(2.12)
Social Emotional Skills				
(16)	Self-awareness	73.28	72.36	0.92
		(1.19)	(1.15)	(1.68)
(17)	Number of friends	37.00	38.10	-1.11
		(0.91)	(1.31)	(1.58)
(18)	Emotional awareness	26.77	25.52	1.25
		(1.55)	(1.37)	(2.06)
(19)	Solving conflict	30.86	33.45	-2.59
		(1.81)	(1.86)	(2.57)
Executive Function				
(20)	Memory	55.02	56.59	-1.58
		(1.42)	(1.27)	(1.91)
(21)	Inhibitory control	16.32	16.50	-0.18
		(0.90)	(0.88)	(1.25)
Sample Size				
	N	708	728	1436

*Notes: Sample size for treatment and comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 32 displays similar results as shown in Table 31. Instead of breaking results down by the 21 sub-tasks, it is broken down by the six domains of school-readiness. The assignment of these sub-tasks to their relevant

Domains is depicted in Figure 3 in the Survey Instruments section. Each of the six domains is an average score the sub-tasks that fall within the criteria of their respective domain. For example, Domain 1 for Motor Skills (Gross and Fine) is an average of the scores to sub-tasks 1, 2 and 3 in Table 31, which correspond to copying a shape, drawing a person, and hopping, respectively.

Also included in this table is the "Approaches to Learning" category, although it has not been included in the overall IDELA score. This category is reported by the enumerators who are asked to make an assessment of the child's ability to concentrate and hold interest during the assessment. This is subjective and because it is not a direct and objective measure where the child themselves is providing the data, we do not include it in the IDELA score, but still think it is valuable to present as a standalone measure. This method is also employed by Amadu, Salifu, et al. in an IDELA baseline report for an ECD intervention in Ghana.

Again in Table 32, none of the domains are statistically different between treatment and comparison groups. This is evident by the fact that there are no significance stars in this table.

Table 32: Domain Means and Difference in Means Across Comparison and Treatment

	Variable	Comparison	Treatment	Difference
(1)	*Motor Skills*	63.40	65.00	-1.59
		(1.58)	(1.48)	(2.14)
(2)	*Early Literacy*	26.57	25.86	0.70
		(0.89)	(0.77)	(1.17)
(3)	*Early Numeracy*	35.82	35.44	0.38
		(0.86)	(0.88)	(1.23)
(4)	*Social Emotional Skills*	42.04	42.36	-0.32
		(0.97)	(1.09)	(1.46)
(5)	*Executive Function*	35.73	36.55	-0.81
		(0.98)	(0.90)	(1.34)
(6)	*Approaches to Learning*	81.19	83.90	-2.71
		(1.32)	(1.45)	(1.94)
	N	708	728	1436

*Notes: Sample size for treatment and comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 33 presents the results for IDELA. IDELA is a composite score of a selection of the Domains listed horizontally in Table 32. In this analysis, IDELA is calculated by an average of the following five domains: motor skills (gross and fine), early literacy, early numeracy, social emotional skills and executive function. This is also depicted in Figure 1. There is no statistical difference in the IDELA composite score between treatment and comparison schools.

Table 33: IDELA Means and Difference in Means Across Comparison and Treatment

	Variable	Comparison	Treatment	Difference
(1)	*IDELA Score*	40.71	41.04	-0.33
		(0.88)	(0.84)	(1.21)
	N	708	728	1436

*Notes: Sample size for treatment and comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

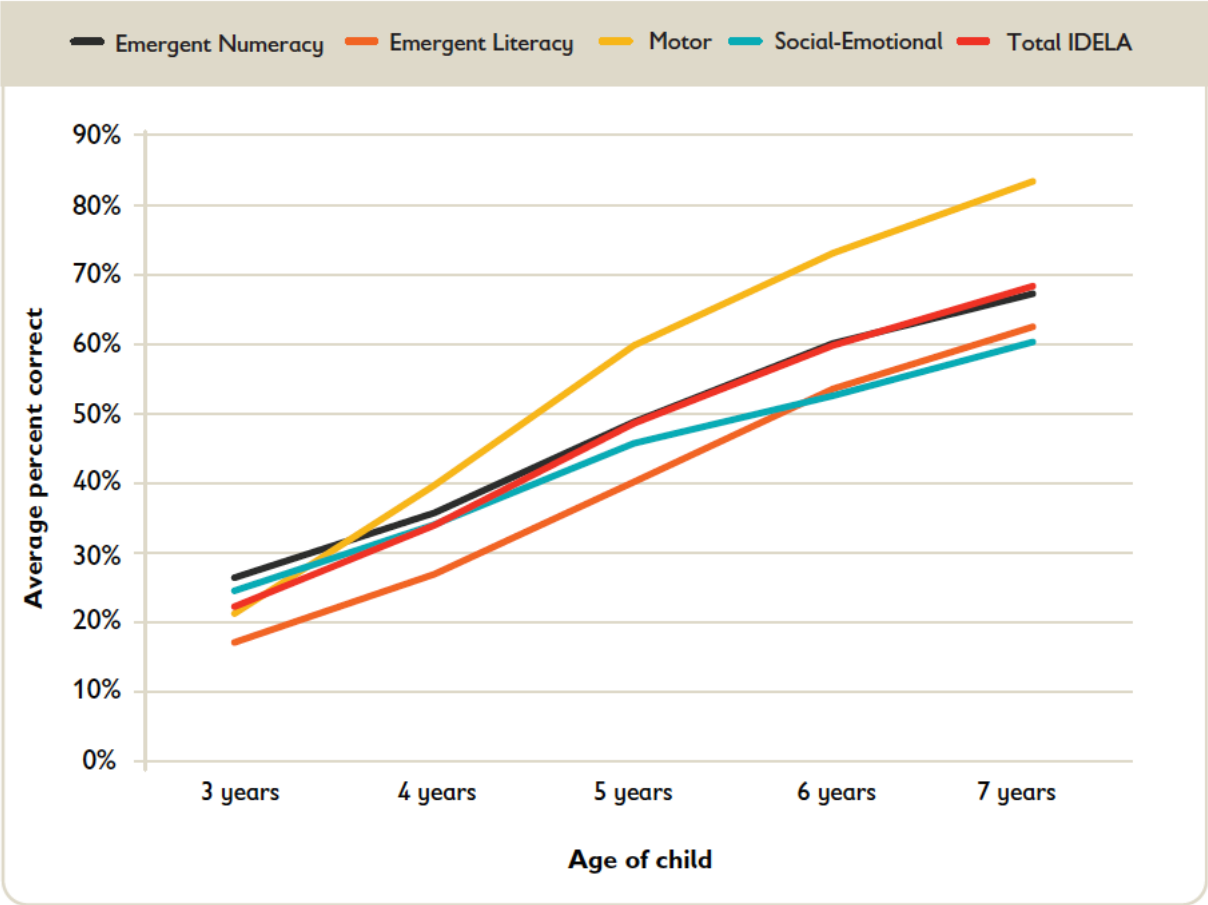
4.5 Expected Competencies in IDELA Domains

Save the Children produced a report, *Beyond Access: Exploring Equity in Early Childhood Development and Learning*, in mid-2018 reflecting on learnings acquired from implementing the IDELA assessment across over 38 sites and 20,513 children aged 3 to 6 living in diverse contexts throughout the world; the previous IDELA study in Uganda is included as part of this analysis. Their findings indicate that less than one-third of children are transitioning into primary school at age 6 with the necessary foundational early literacy, numeracy and social-emotional skills needed to succeed.

The report details specifically how age and gender are related to IDELA scores using multivariate regression analysis. Findings demonstrate, perhaps not surprisingly, that performance on all domains display a position association with age. For all domains, they find a small to medium effect size gain per year of age, with motor skills displaying the steepest developmental trajectory and social-emotional skills development the shallowest, as outlined in the graph below.

The data is not longitudinal, so the finding does not represent the expected growth from one year to the next, but it does provide a rough approximation of a typical year of learning and development as measured by IDELA.

Graph 4: Average Learning and Development by Age and Gender



The IDELA tool was designed to measure skills that help children successfully transition into primary school classrooms, based on existing curricula and standards from around the world. Learning outcomes were analyzed for 6-year-old children preparing to enter primary school to estimate where children fall on the continuum of learning development at this critical point. They define ‘mastering’ as scoring 75 percent correct or better on the overall assessments or within a particular skill area; ‘struggling’ is defined as scoring under 25 percent correct, and ‘emerging’ represents children with scores from 25-74 percent correct.

Figure 5: Proportion of 6-year-olds by Domain and Performance Level

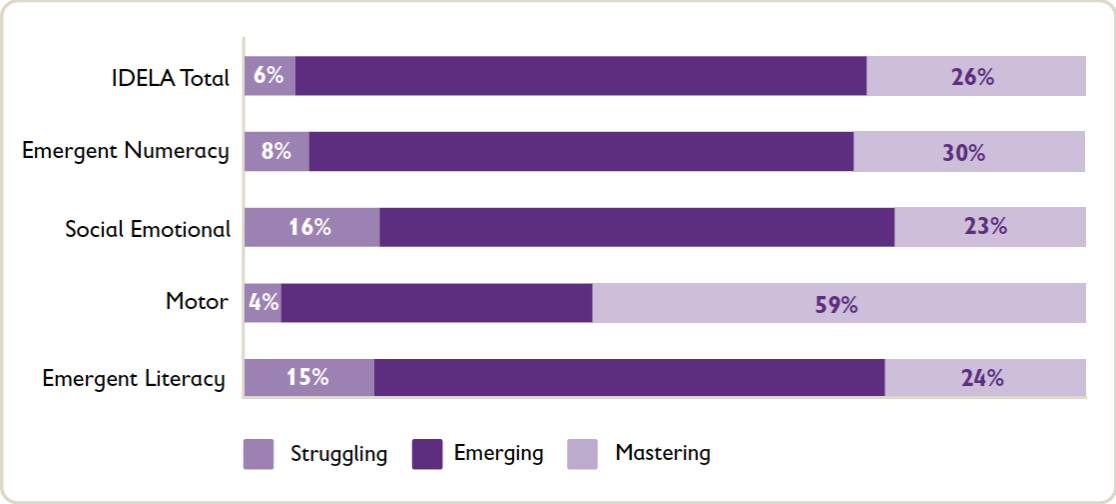


Figure 6: Median Scores for 6-year-olds by Domain

Task	Median score (Age 6)	Description "A typical child can…"
Emergent Numeracy		
Comparison by Size and Length	100%	Correctly compare objects by size and length.
Sorting and Classification	50%	Sort by one criterion but not two.
Shape Identification	60%	Identify 3 out of 5 shapes.
Number Identification	40%	Identify 8 out of 20 numbers.
One-to-One Correspondence	67%	Count less than 10 objects, but not quantities more than 10.
Addition and Subtraction	67%	Answer 2 out of 3 simple arithmetic questions.
Puzzle Completion	33%	Fit 2 puzzle pieces together.
Social-Emotional		
Self-Awareness	67%	Knows basic information about themselves and their family but not the country or village they live in.
Friends	40%	Name 4 friends.
Emotional Awareness/ Regulation	50%	Identify simple emotions but not identify methods for dealing with negative emotions.
Solving Conflict	50%	Identify at least one way to solve a common social problem.
Empathy/Perspective Taking	60%	Understand the emotions of another and identify one way to help them.
Emergent Literacy		
Expressive Vocabulary	45%	Name 4-5 types of common food or animals.
Print Awareness	67%	Open a book and point to print on a page but does not know the direction of text.
Letter Identification	30%	Identify 6 out of 20 letters.
First Letter Sounds	33%	Identify 1 letter sound.
Oral Comprehension	80%	Answer 4 out of 5 questions asked after a short story is read to them.
Emergent Writing	75%	Write letters but not their name.
Motor		
Copying a Shape	100%	Copy a simple shape.
Drawing a Person	75%	Draw a person with multiple details (body parts).
Folding Paper	75%	Follow instructions to fold paper 3 out of 4 times.
Hopping	100%	Hop 10 steps on one foot.

At endline, we will utilize these median scores and expected performance targets to analyze the percentage of 6-year-olds graduating from ECD centers who meet the targets. Additionally, we will compare our findings with those in this study to assess the achievement of learning outcomes for children in AKF-supported schools against other children. We will also compare achievement of expected performance targets between children in treatment versus comparison schools. This will allow us to further measure whether the AKF program is contributing to greater improvements in the school readiness of children and helping them successfully transition into primary school.

5 Analysis Across Other Key Metrics

In the previous section, we assess equivalency across the treatment and comparison groups. This section provides a different view on the data and analysis across other key metrics. This section starts with an analysis on the differences between replacement and non-replacement schools in overall scores for children as well as differences in teachers and the school environment. The analysis proceeds to a discussion on the differences in the performance of male and female children in regards to the sub-tasks and domains from the school readiness assessment and the overall IDELA score. Next, differences across districts are presented across the key areas of IDELA scores, teachers and infrastructure. Finally, the section concludes with the differences between teachers, children, and schools in rural, urban and peri-urban environments.

5.1 Differences for the Replacement Schools[2]

Replacement Schools: Differences in Teachers

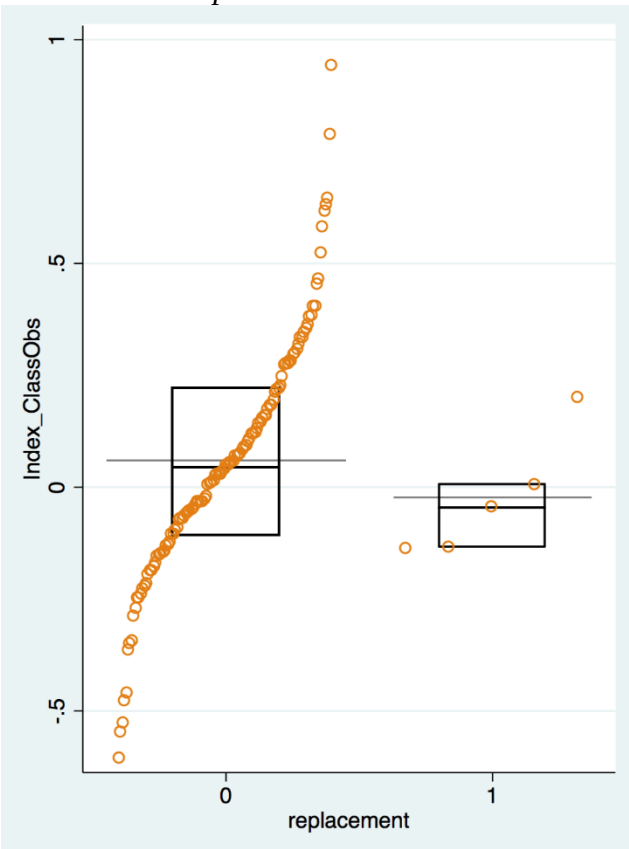
In order to ease the exploration of teacher and school level results across multiple other dimensions such as district and geographic location, an index was created that includes the teacher behaviors observed in the classroom as well as the infrastructure of the indoor and outdoor environments. We call this index the Classroom Observation and Infrastructure Index.

This diagram shows the differences in this index across the three districts. The Classroom Observation and Infrastructure index includes variables across the following categories: equal gender participation in the classroom, diversity education, classroom and school yard infrastructure and spacing. The index also looks at the opportunities that teachers give children to develop skills and looks at the teachers' use of the curriculum and how they track the learning progress of their children. Finally, the index covers the availability of class materials such as readers and the behaviors exhibited by the teachers for punishment as well as supervision more generally.

The difference in the means of the classroom observation and infrastructure index across the replacement and non-replacement schools is not statistically significant (p-value of 0.50). From the graph, we can see that there were only five points of observation for the replacement schools and many more for the non-replacement schools. It can also be seen that the mean for the replacement schools is lower than that of the non-replacement schools, however this difference is not statistically significant.

[2] As a reminder, the term 1 school holiday separated the time period for data collection in replacement schools. Data for the majority of schools was collected in April 2018. The school holiday was in May. Data on the four replacement schools was collected in early June, one week after schools opened for term 2. No teaching happened in replacement schools from the end of term 1 until data collection in term 2.

Graph 5: Differences in Classroom Observation and Infrastructure Across Replacement and Non-Replacement Schools



Replacement Schools: Differences in School Readiness Scores

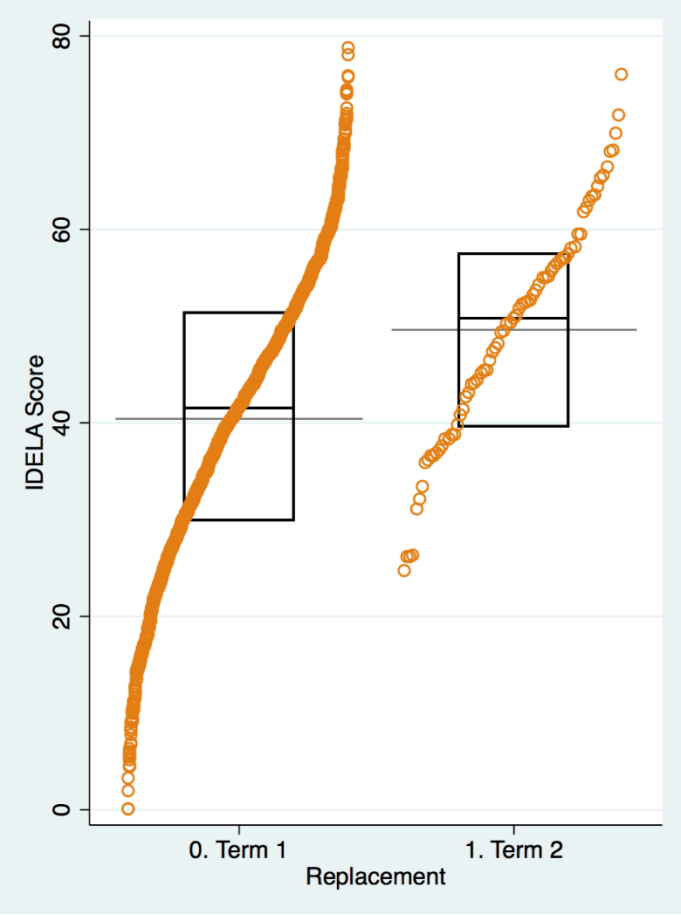
Table 34 shows the differences in domain scores between the schools that were successfully tested in Term 1 (75 schools) and those that spilled over into Term 2 (4 schools). The schools that were tested in Term 2 are called Replacement Schools in the table below. This analysis shows that across every domain, Term 2 (replacement) schools had higher domain scores than non-replacement (Term 1) schools. Each of these differences is significant at the 5% level or greater.

Table 34: Differences in Domain Scores between Schools Tested in Term 1 and Term 2

	Variable	Term 1	Term 2	Difference
(1)	*Motor Function (Gross and Fine)*	63.43	78.42	-15.00***
		(1.07)	(1.84)	(1.93)
(2)	*Early Literacy*	25.92	31.43	-5.51**
		(0.58)	(2.90)	(2.60)
(3)	*Early Numeracy*	35.21	43.29	-8.08**
		(0.58)	(3.84)	(3.40)
(4)	*Social Emotional Skills*	41.67	51.83	-10.17***
		(0.71)	(2.09)	(1.96)
(5)	*Executive Function*	35.76	43.17	-7.41***
		(0.66)	(1.34)	(1.34)
(6)	*Approaches to Learning*	82.39	85.81	-3.42**
		(1.04)	(1.42)	(1.62)
	N	1361	75	1436

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Graph 6: IDELA Scores Across Non-Replacement (Term 1) and Replacement (Term 2)



The above graph shows the IDELA scores across replacement and non-replacement schools. Using a one-way ANOVA test, there is a statistically significant different across these two groups (p-value of 0.00).

Because there is a strong indication that testing in the next term (replacement schools) led to a difference in IDELA scores, we will need to mitigate the risk this poses to the evaluation. Luckily, this is a fairly simple fix. During the endline data analysis phase we will create a dummy variable for the four replacement schools and control for it by adding this additional variable in the regression analysis. These replacement schools will be analyzed together with the other schools and separately in order to fully understand the interactions in the data for these four schools at endline.

5.2 Differences in School Readiness Scores Across Gender

The primary data collected on children for this evaluation was in the form of the IDELA, which is an internationally recognized test on the school readiness of children in their pre-primary years. Children in the Baby and Middle classes were given tasks that fall within 21 categories. Please refer to Figure 4 to review what these domains are and how they are averaged to form the overall IDELA score.

Tables 35, 36 and 37 test if children have statistically different scores across the IDELA sub-tasks at baseline due to their gender. In Table 35 below, there are seven sub-tasks that show a statistically significant difference for gender and they are as follows: one to one correspondence, simple operations, solving conflict, memory, letter sounds, writing level and oral comprehension. For six out of the seven sub-tasks that are different at a statistically significant level, female children are more likely to have lower scores than their male counterparts. The exception to this rule is the subtask for Writing Level, in which female children are more likely to score higher on this than their male peers and this is also statistically significant. There are other differences to note in this table that are quite large, but are not statistically significant. This includes the sorting sub-task, in which males score better, and the print awareness subtask, in which female children score better.

Table 35: Sub-Tasks Across Female and Male Children

	Variable	Male	Female	Difference
Motor Skills (Gross and Fine)				
(1)	Copying a shape	62.94	64.08	-1.14
		(1.61)	(1.87)	(1.86)
(2)	Draw a person	56.25	56.22	0.03
		(1.28)	(1.43)	(1.48)
(3)	Hopping	73.44	72.33	1.11
		(1.58)	(1.81)	(1.70)
Early Literacy				
(4)	Expressive vocabulary	31.35	29.41	1.94
		(0.88)	(1.23)	(1.18)
(5)	Print awareness	30.16	32.00	-1.84
		(1.60)	(1.48)	(1.64)
(6)	Letter identification	7.99	9.18	-1.19
		(0.99)	(1.11)	(0.90)
(7)	Letter Sounds	11.59	9.67	1.93**
		(0.89)	(0.91)	(0.96)
(8)	Writing	55.64	58.25	-2.61**
		(1.30)	(1.33)	(1.17)
(9)	Oral comprehension	21.52	17.03	4.49***
		(0.95)	(0.91)	(1.14)
Early Numeracy				
(10)	Comparison of size and length	79.93	78.29	1.64
		(1.08)	(1.12)	(1.36)
(11)	Sorting and classification	23.17	21.00	2.17
		(1.43)	(1.44)	(1.76)
(12)	Shape identification	49.42	47.97	1.45
		(1.54)	(1.38)	(1.65)
(13)	Number identification	11.88	12.86	-0.98
		(0.95)	(1.00)	(0.92)
(14)	One to one correspondence	20.79	17.62	3.17**
		(1.33)	(1.04)	(1.49)
(15)	Simple operation	33.29	30.86	2.43*
		(1.29)	(1.18)	(1.38)
Social Emotional Skills				
(16)	Self-awareness	73.56	72.04	1.52
		(0.90)	(1.01)	(1.02)
(17)	Number of friends	37.65	37.46	0.19
		(0.97)	(1.11)	(1.33)
(18)	Emotional awareness	26.66	25.57	1.09
		(1.25)	(1.50)	(1.83)
(19)	Solving conflict	33.83	30.43	3.40*
		(1.67)	(1.57)	(1.93)
Executive Function				
(20)	Memory	56.90	54.68	2.21*
		(1.06)	(1.16)	(1.18)
(21)	Inhibitory control	17.12	15.66	1.46
		(0.77)	(0.80)	(0.95)
Sample Size				
	N	736	700	1436

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 36 shows the next level of analysis of the gender disparity in scores at baseline by using the Domains instead of the sub-tasks. In this view, we see that male children score better than female children in the Early Numeracy and Executive Function domains at 1 percent and 5 percent levels of statistical significance, respectively. Female children are slightly better than males at Motor Skills (Gross and Fine) and Approaches to Learning, but these differences are not statistically significant.

Table 36: Domains Across Female and Male Children

	Variable	Male	Female	Difference
(1)	*Motor Function (Gross and Fine)*	64.21	64.21	0.00
		(1.14)	(1.35)	(1.23)
(2)	*Early Literacy*	26.38	26.03	0.34
		(0.65)	(0.67)	(0.62)
(3)	*Early Numeracy*	36.41	34.81	1.60*
		(0.79)	(0.66)	(0.81)
(4)	*Social Emotional Skills*	42.93	41.43	1.49
		(0.85)	(1.00)	(1.15)
(5)	*Executive Function*	37.01	35.24	1.77**
		(0.74)	(0.81)	(0.83)
(6)	*Approaches to Learning*	82.45	82.69	-0.25
		(1.15)	(1.06)	(1.01)
	N	736	700	1436

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Finally, in Table 37 we see that the overall IDELA composite score is not statistically significant between female and male children. Overall male children do outperform female children, but this difference is not statistically different. This shows that the differences between female and male children that we see in the sub-tasks and domains are not large enough to cause a significant gender disparity in the overall IDELA scores.

Table 37: IDELA Composite Score Across Female and Male Children

	Variable	Male	Female	Difference
(1)	*IDELA Score*	41.39	40.35	1.04
		(0.63)	(0.73)	(0.65)
	N	736	700	1436

*Notes: Sample size for Treatment and Comparison is listed in the last row of the table. Standard errors are robust and clustered by school. They are recorded in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

These differences are not at all indicative of problems in the sampling procedure, rather it indicates that there are differences between the male and female children at baseline therefore leading to differences in school readiness. These tasks will be repeated during the AKFU endline survey and therefore it will be important to see if the gap between the male and female children is reduced during this time in the schools that received treatment and those that did not. It will also be interesting to see if this gap naturally widens or closes in the schools that are not receiving any treatment.

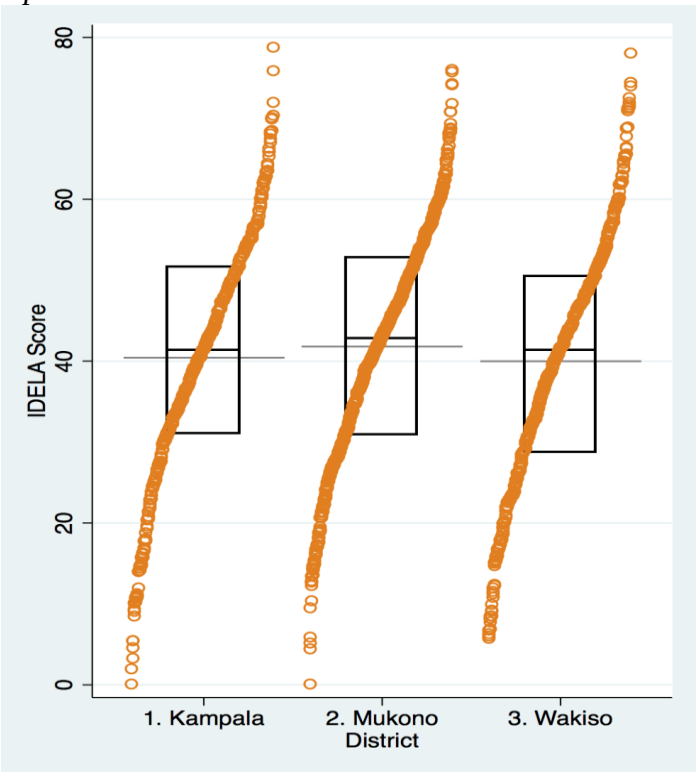
5.3 Differences in Key Metrics Across Districts

Differences in School Readiness Scores Across Districts

The analysis of the IDELA scores across the three districts concludes that there is no statistical difference in IDELA scores across the different districts of Kampala, Mukono, and Wakiso using a one-way ANOVA test (p-value of 0.30). The distributions of each are fairly normal, with a slightly downward bias in Mukono District. The long, thin line on each box represents the mean of the data. The means are very similar. The shorter, bold line on each of the three boxes represents the median of each data set. Similar to the breakdown

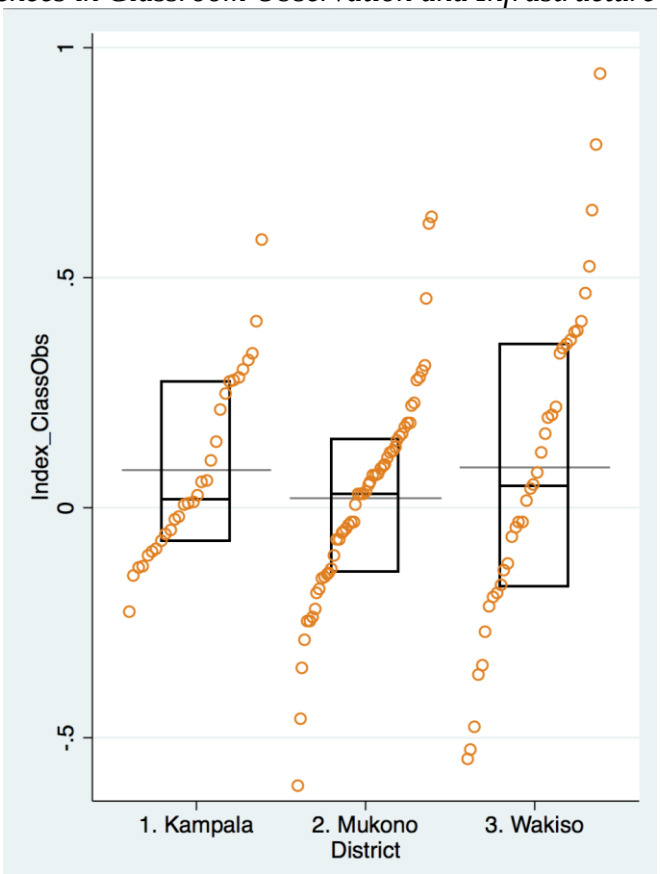
of the scores by geographic region (Rural, Urban, Peri-Urban), the mean and median IDELA scores hover around 40 percent for each district.

Graph 7: IDELA Scores Across Districts



Differences in Teachers Across Districts

Graph 8: Differences in Classroom Observation and Infrastructure Across Districts



A one-way ANOVA test shows that differences across classroom observations and infrastructure are not statistically significant across the three districts (p-value of 0.42). Of the districts, Wakiso has the highest value of the index and Mukono District scores the lowest. Kampala and Wakiso are close in value to each other. Kampala has the most tightly centered distribution, whereas Mukono and Wakiso both have a broader distribution with more outliers, both positive and negative.

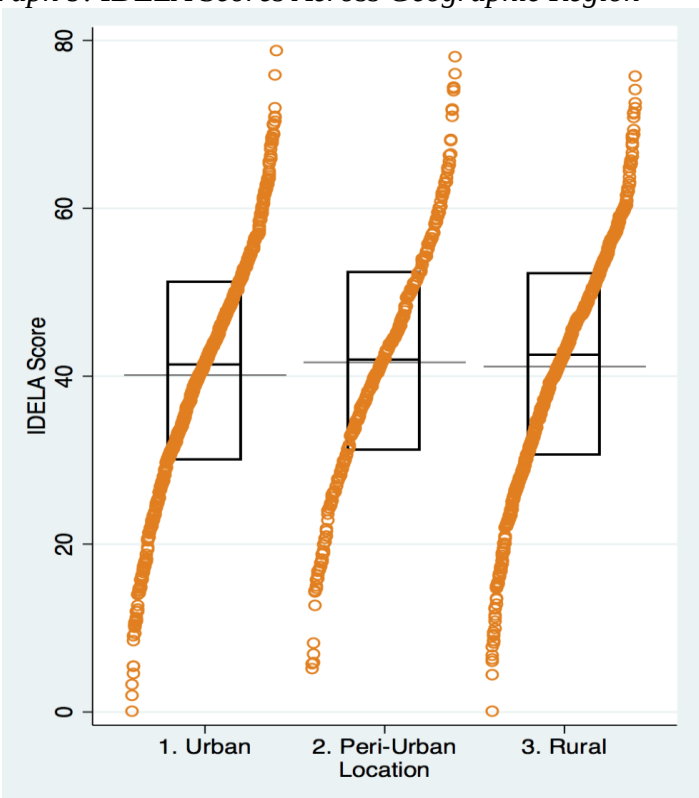
5.4 Differences in Key Metrics Across Geographic Location

Differences in School Readiness Scores Across Rural, Urban and Peri-Urban Locations

In an analysis of the IDELA scores by geography (Rural, Urban, Peri-Urban) we determine that there is no statistical difference between the scores across these regions (p-value of 0.11). This was done by assuming normality of the score distribution (see Appendix for the graphical distribution of IDELA scores) and then running a one-way ANOVA test to determine if any one of the means of these groups is different from the others. By definition, the one-way analysis of variance (ANOVA) is used to determine whether there are any statistically significant differences between the means of three or more independent groups. The box plot below represents the distribution of the IDELA scores across the three groups, and it can be see that they are indeed quite similar.

The long, thin line on each box represents the mean of the data. The means are very similar. The shorter, bold line on each of the three boxes represents the median of each data set. In this case, the median value is an IDELA score that is slightly more than 40 percent for Urban, Peri-Urban, and Rural. The part of the box below the line is equal to the 25th-50th percentile, whereas the part of the box above the line is equal to the 50th -75th percentile of the data. The lines coming out of the graphs represent the individual data points for each child. In addition, they display the top and bottom quartiles of the data. When the top and bottom lines are of fairly equal size the data is normally distributed. This is the case for urban and peri-urban schools. The rural schools have a slightly longer line on the bottom, meaning that the distribution is slightly downward biased and there are more lower scores than higher scores. There are no significant outliers in the data. This is represented by the fact that there are no individual data points that fall way below or above the others.

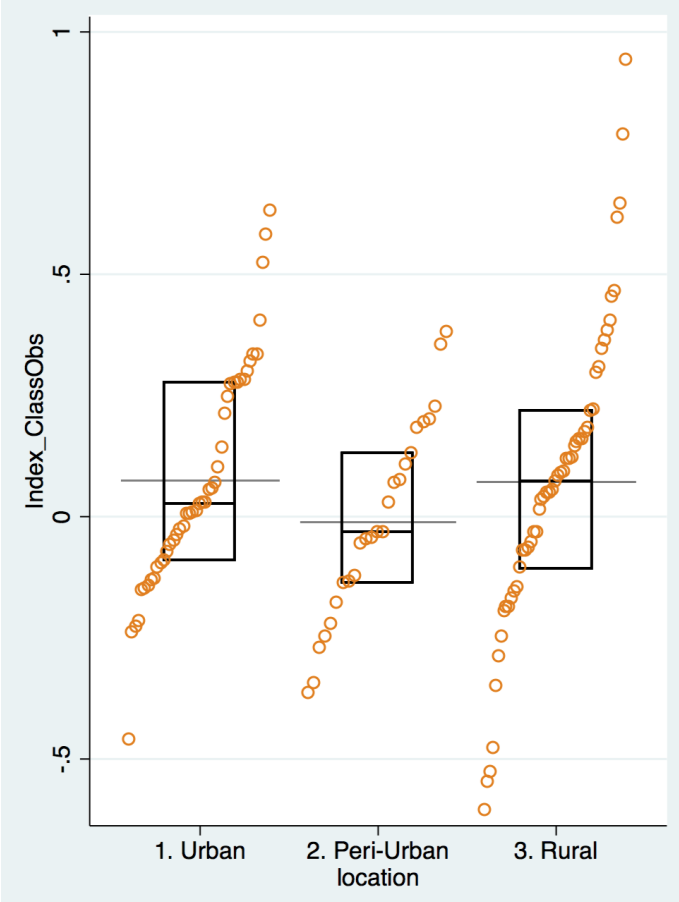
Graph 9: IDELA Scores Across Geographic Region



Differences in Teachers Across Districts and Rural, Urban, and Peri-Urban Geographic Locations

Additionally, we find that there is no statistical difference in the classroom observation and infrastructure index across the three different geographic locations in the study (p-value of 0.37). Interestingly, the rural and urban regions have a similar mean, whereas we might have hypothesized that urban regions would be operating at a high level of capacity than the rural regions. In fact, the darker line on the urban graph represents the median and shows that the median index of the urban schools is lower than that of the rural schools. The peri-urban schools have a lower mean and median than both of the other designations.

Graph 10: Differences in Classroom Observation and Infrastructure Across Geographic Location



6 Conclusion

6.1 Conclusions for the Baseline

The major finding from the baseline evaluation is that the baseline assignment of comparison to treatment schools is clean and unbiased in overall performance across school facilities, infrastructure, school management and school readiness scores among children. The most notable differences between treatment and comparison sites lie with teachers regarding their education level, training, access to resources and observable behaviors in the classroom. We theorize that this is possibly due to the teacher training that occurred for some AKFU teachers prior to the baseline, but this remains to be confirmed by AKFU.

It is important to note across all of these teacher categories, however, that only a small proportion of differences in the responses to questions or observed behaviors are statistically significant, meaning that the baseline equivalency of teachers in this study is also largely unbiased and will present a clean estimation of results at endline.

Based upon these findings, we expect to be able to deliver an effective endline evaluation that will measure unbiased estimations of the changes triggered as a result of the AKFU interview in treatment versus comparison schools.

Below is a summary of additional conclusions from the baseline regarding certain components of the evaluation, specifically regarding the teacher interview and classroom observation data. These findings should be reviewed by AKFU and taken into consideration during future planning and delivery of the program.

Findings from the Teacher Interview

- Resources for Teaching
  - There is a lack of sufficient materials in classrooms. Eighty percent of the teachers believe that they do not have enough resources for teaching. In treatment schools only 5 percent of teachers report that they have readers available for their children. This is 10 percentage points less than the comparison school teachers, and this difference is statistically significant. In fact, with the exception of wall clocks, this was the item that teachers were least likely to have available in their classrooms.
  - In addition, none of the teachers observed had any local language books in their classroom. Given that 16 percent of teachers in treatment schools use Luganda as the primary language of instruction and 50 percent use a mix of Luganda and English, it would seem that the materials should appropriately reflect this balance and include local language materials alongside English.

- Support from the Administration
  - One-third of teachers are observed only monthly and 20% are observed only termly.

- Teacher Absenteeism
  - 16% of teachers in treatment schools missed school in the last week, and of those that missed they missed 1.58 days on average. Given that there is only around 1 teacher per class on average, that is 1.58 days of missed instruction for the children on average.

- Attrition
  - Around 70 percent of comparison school teachers and 62 percent of treatment teachers state that they do not plan to stay working as a pre-primary teacher in their current school. If these teachers follow through on their plans, then this is a definite attrition risk. Moreover, this presents a major program risk if trained teachers leave the centers. It should be taken into account that monitoring should be done on these teachers so that as much as possible, the same teachers can be interviewed at endline as were at baseline.

- Punishment
  - 16 percent of treatment teachers admit that they engage in physical punishment. However, during the classroom observations very little was seen in terms of negative physical and verbal interactions between teachers and children.

Classroom Observations

- Of the treatment schools observed, 80 percent of the classrooms did not have English books available for the children. The minority (13 percent) that did have books fell into the category of 1 to 14 books.

The endline evaluation will be executed at the close of the school year in 2019. Engagement with AKFU to monitor the presence of sampled teachers and children for the survey will be ongoing prior to the endline to reduce possible attrition in the sample.

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List of Annexes

IDELA Histograms

Figure 1

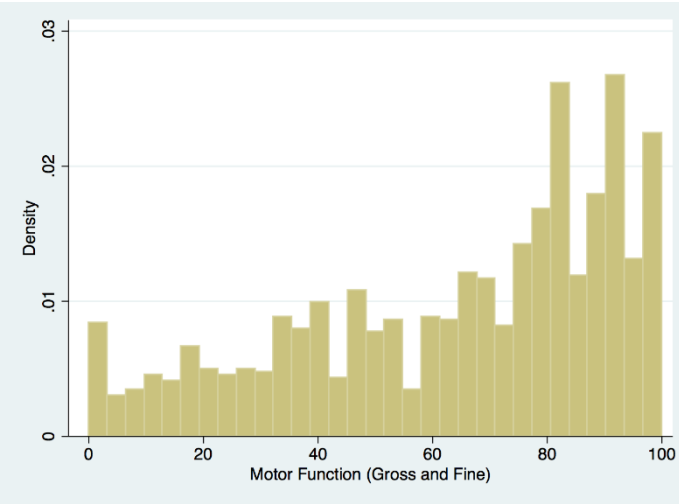

Figure 2

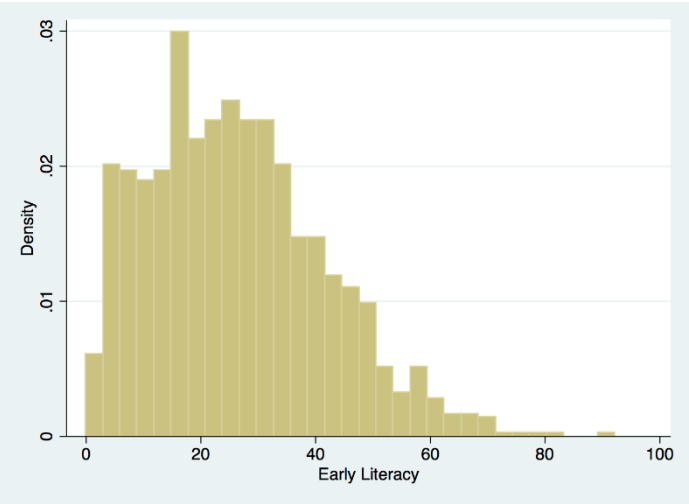

Figure 3

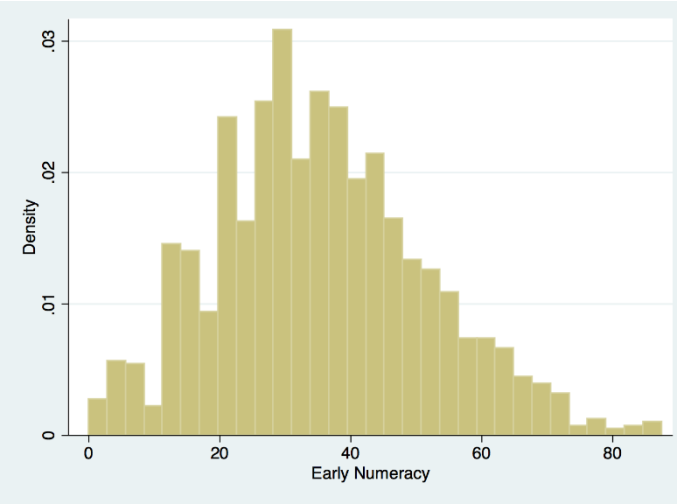

Figure 4

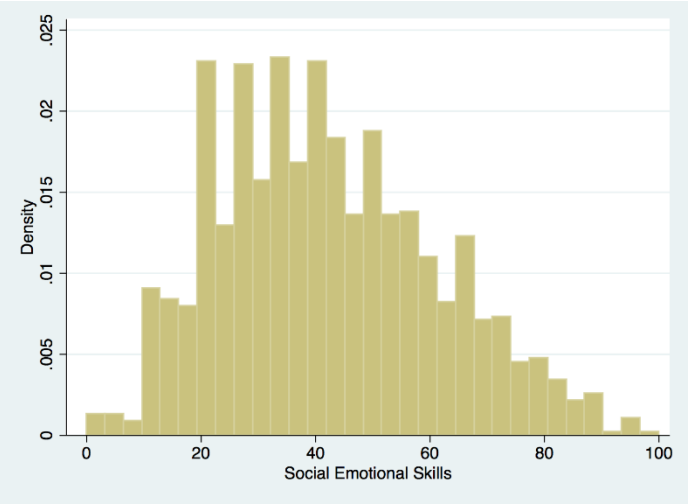

Figure 5

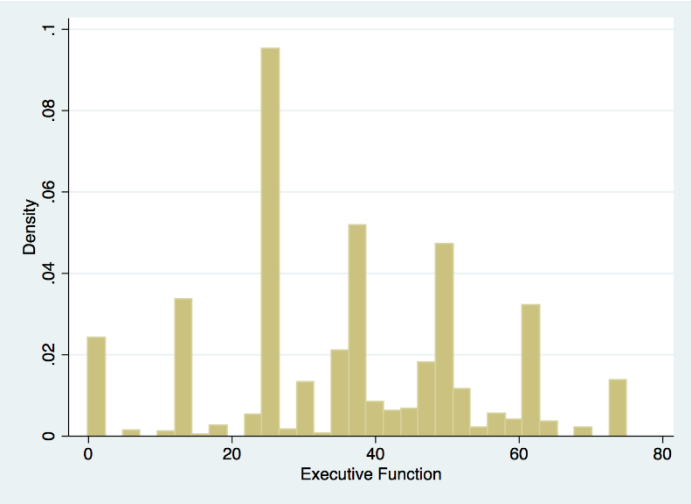

Figure 6