



# Student learning and development outcomes

The impacts of Fursa kwa Watoto (FkW

\*All measures are aligned with the Basic Education Syllabus for Standard I

# Outline

- Fursa kwa Watoto
- The Learning Agenda
- Tanzania policy and pre-primary context
- Effects of FkW on instructional practices and learning environments
- **Effects of FkW on student outcomes**
- Financing for pre-primary
- Summary and policy recommendations
- Scaling quality pre-primary: 15 reasons why FkW should be adopted





# “Skills beget skills”

- Quality pre-primary is the foundation for learning.
- Starting early maximizes critical developmental periods.
- Children who master foundational cognitive, social, and developmental skills early on are better prepared to acquire increasingly sophisticated skills from STD 1 to adulthood.
- Investing in high quality early childhood education is both impactful and cost effective.
- Cognitive and social emotional skills are complementary.
  - Gaining social emotional, or character skills, helps students master cognitive skills with “greater impacts on achievement and life outcomes”.
  - Character skills are important over the lifespan and drive lifelong success.
- “Quality matters” and “high quality programs produce high quality outcomes.”

Heckman, J. and Tim Kautz. (2013). “Fostering and measuring skills: Interventions that improve character and cognition.” NBER Working Paper No. 19656. November 2013. Available online at <https://heckmanequation.org/www/assets/2013/12/Fostering-and-Measuring-Skills.pdf>

Heckman, J. “Early childhood education: Quality and access pay off.” The Heckman Equation. Available online at <https://heckmanequation.org/resource/early-childhood-education-quality-and-access-pay-off/>



# Does FkW lead to improved early reading?

Students were tested on pre-literacy skills that predict students' reading outcomes in later grades such as:

- ✓ Vocabulary
- ✓ Letter identification
- ✓ Knowledge of letter sounds
- ✓ Listening comprehension
- ✓ Writing skills





# Does FkW lead to improved early numeracy?

Students were tested on pre-numeracy skills that predict math outcomes in later grades, such as:

- ✓ Counting and number identification
- ✓ Addition and subtraction
- ✓ Shape identification, drawing, and manipulation
- ✓ Spatial vocabulary



# Does FkW lead to improved social development, health knowledge, and executive function?

Students were also tested on social-emotional skills, health knowledge and executive function:



**Social-emotional skills** include identifying and understanding feelings and emotions.

**Health knowledge** includes identifying body parts, nutritious foods, safety hazards, and sanitary behaviors

**Executive function** includes ability to follow instructions, use of working memory, and fine motor skills.





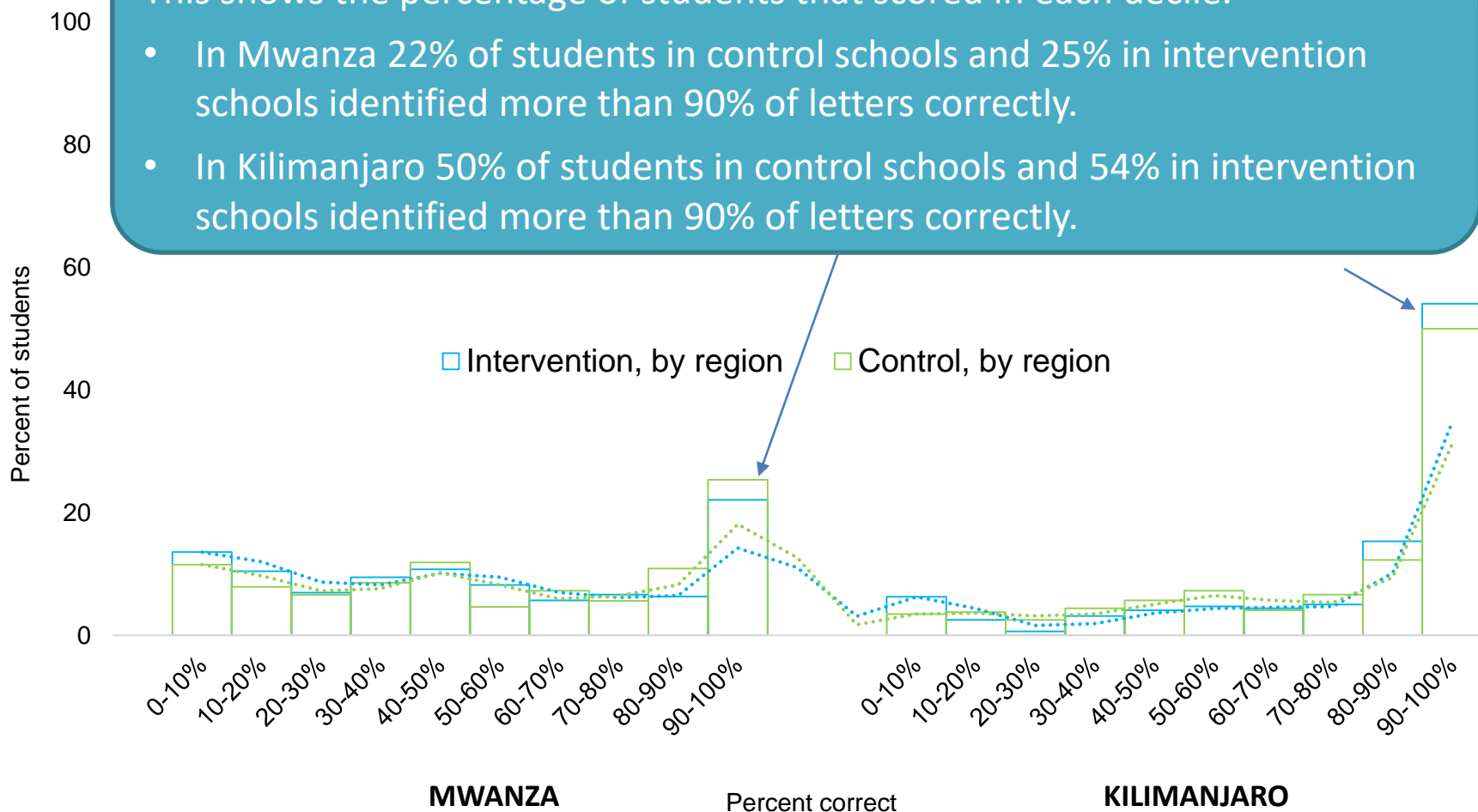
**Student  
outcomes:  
Pre-literacy  
skills**

# Letter name knowledge, by region (out of 20)

Child asked to name letters of the Swahili alphabet

This shows the percentage of students that scored in each decile.

- In Mwanza 22% of students in control schools and 25% in intervention schools identified more than 90% of letters correctly.
- In Kilimanjaro 50% of students in control schools and 54% in intervention schools identified more than 90% of letters correctly.

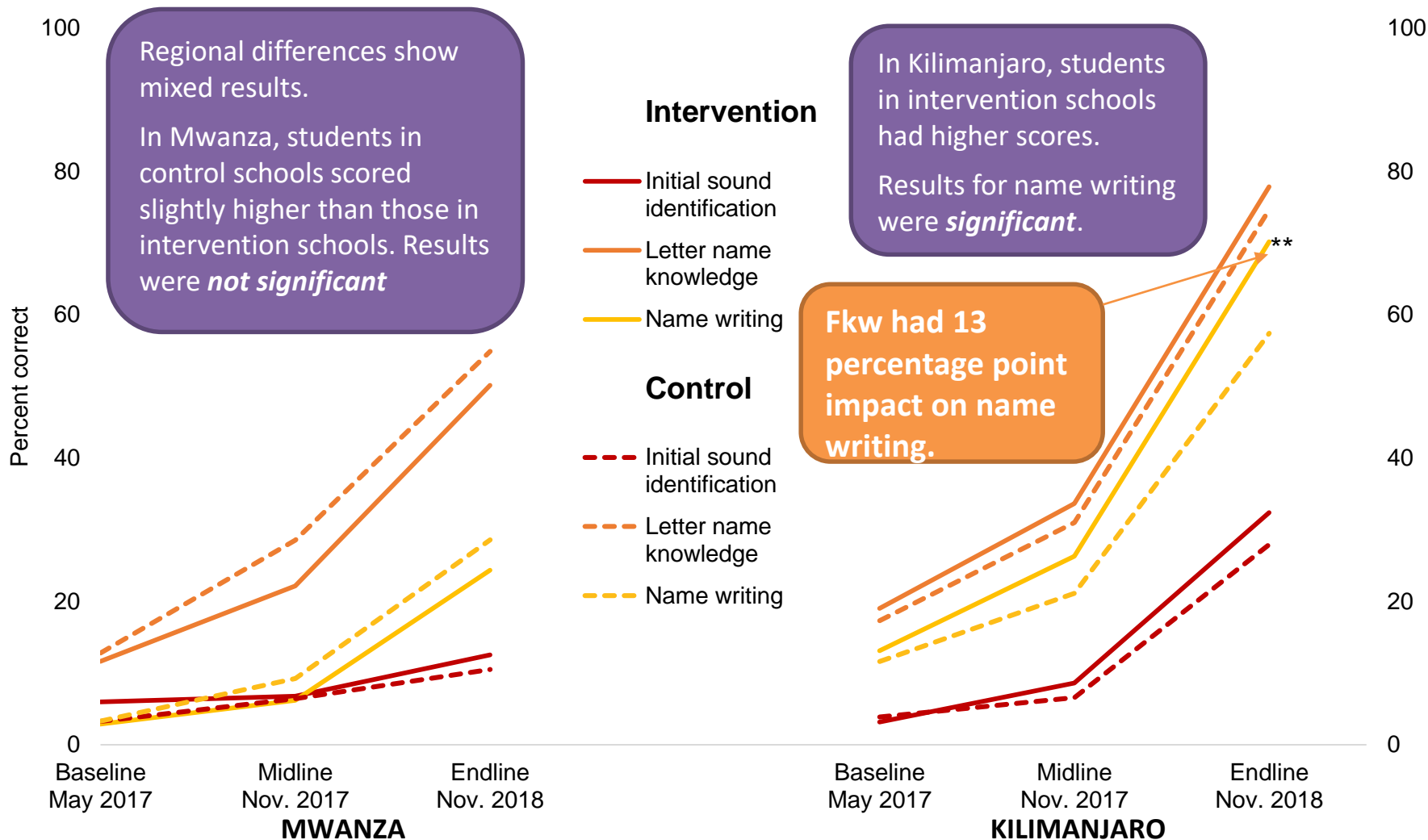


\* Between-group differences are statistically significant at the .05 level  
 \*\* Between-group differences are statistically significant at the .01 level.



# Pre-literacy skills: Average scores over time

Comparing intervention and control students by region



Note: Results may differ from others shown due to sample changes. Figures show regression-adjusted means for students present and task administered at each time point, excluding those in pre-primary at endline.

\* Between-group differences are statistically significant at the .05 level  
 \*\* Between-group differences are statistically significant at the .01 level.

# Pre-literacy impacts by region (actual scores)

	<u>Mwanza</u>			<u>Kilimanjaro</u>		
	Intervention mean n=317	Control mean n=304	FkW impact	Intervention mean n=317	Control mean n=304	FkW impact
<b>Pre-literacy skills</b> (percent correct)						
<b>Initial sound identification</b> (out of 5)	13	11	2	32	28	5
<b>Letter name knowledge</b> (out of 20)	50	55	-5	78	75	3
<b>Name writing</b> (1 if correct, 0 if incorrect)	24	29	-4	70	57	<b>13**</b>

\*, \*\*, \*\*\* Statistically significant at  $p < .05$ ,  $p < .01$ ,  $p < .001$

Randomly selected schools in Mwanza (n=65) and Kilimanjaro (n=65)

Source: Fursa kwa Watoto Learning Agenda– Student assessment data collected May 2017 and November 2019

Note: The table shows regression-adjusted means for the intervention group and control group, respectively, and the corresponding impact estimate.



# Pre-literacy

## Qualitative findings and respondent voices

- In both groups, on average, teachers, head teachers, WEOs, and QAOs report that students are gaining pre-literacy skills. However many students struggle with the basics.
- FkW had important impacts on name writing but not letter sounds.
- Several teachers specifically requested more training in sound identification given their lack of training and experience in letter sounds.
- In Mwanza, teachers report language is a barrier as many students speak Sukuma

“In the discovering of letters they are trying. In letter sounds, there is a challenge. We started learning from the beginning, but when you tell them to say “ba” they won’t do it, so that is the challenge.”

Teacher Mwanza

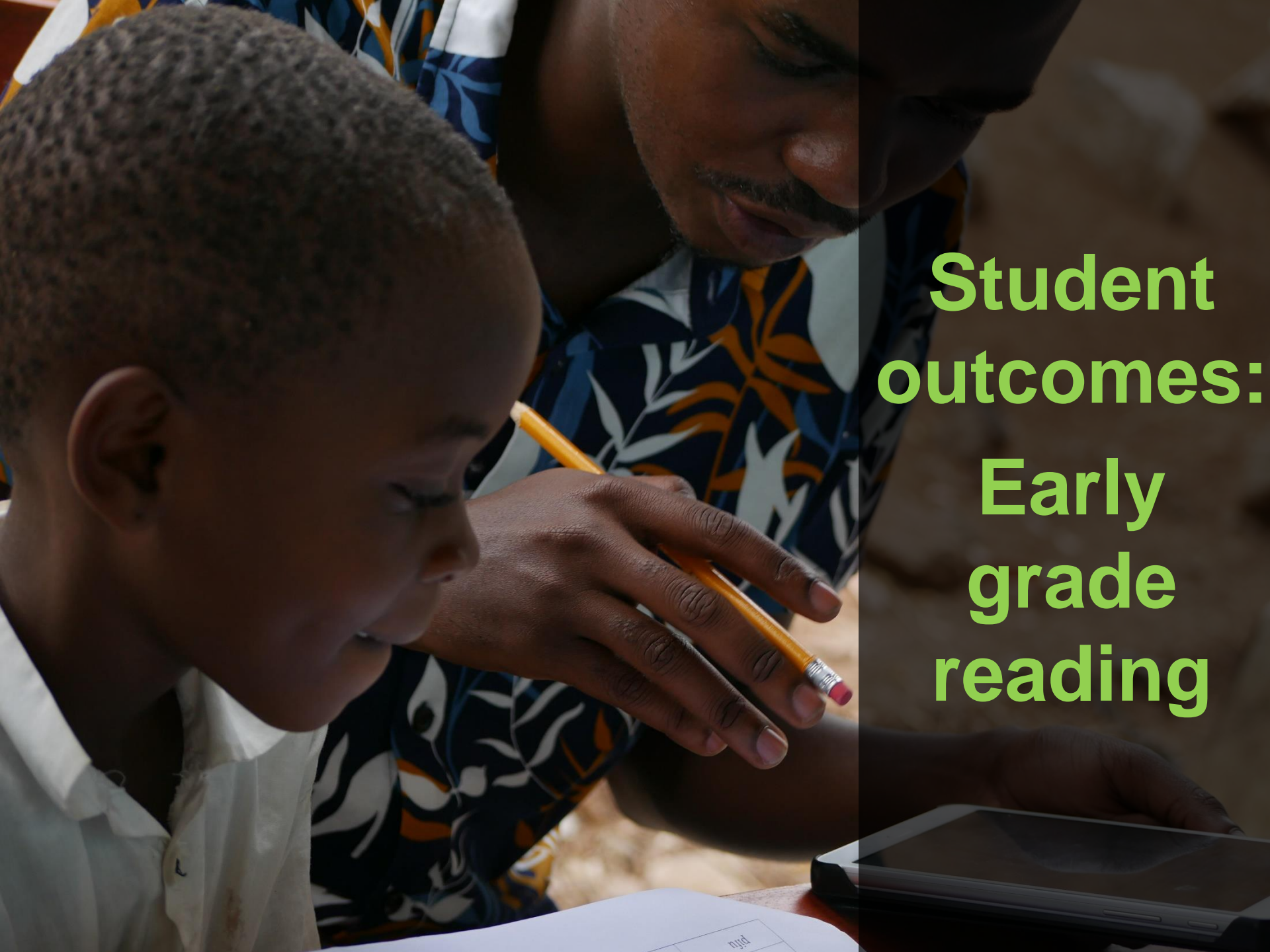
“My challenge is the improvisation of materials. When you prepare a lesson, the materials have to be available. If they are not there, then you have to improvise. So when it comes to the teaching of the children they don’t reach the goal because the class is too big. It must be taught by two teachers. Then when you teach alone some of the children cannot get the materials in the right time.”

Teacher Moshi

“Most of the children here use their native language so this is a problem. By using learning tools and pictures, the children have begun to understand what they are being taught. Although most of them do not understand Swahili.”

Head Teacher Mwanza





**Student  
outcomes:  
Early  
grade  
reading**



# Early grade reading impacts by region

No impacts detected	Mwanza			Kilimanjaro		
	Intervention mean n=317	Control mean n=304	FkW impact	Intervention mean n=317	Control mean n=304	FkW impact
<b>Early grade reading skills</b> (percent correct)						
<b>Syllable reading</b> (out of 100)	12	14	-2	32	32	0
<b>Non-word reading</b> (out of 50)	9	10	-1	26	26	0
<b>Sentence dictation</b> (out of 11)	12	16	-4	42	38	4
<b>Listening comprehension</b> (out of 5)	44	49	-5	68	67	1

\*, \*\*, \*\*\* Statistically significant at  $p < .05$ ,  $p < .01$ ,  $p < .001$

Randomly selected schools in Mwanza (n=65) and Kilimanjaro (n=65)

Source: Fursa kwa Watoto Learning Agenda– Student assessment data collected May 2017 and November 2019

Note: The table shows regression-adjusted means for the intervention group and control group, respectively, and the corresponding impact estimate.

# Early grade reading

## Qualitative findings and respondent voices

- Note that early grade reading tasks were measured when students were in Standard 1. However, only pre-primary teachers participated in FkW training.
- Teachers report that congested classrooms, hunger, absenteeism, students with different abilities, and a shortage of materials undermines literacy education.
- Teachers report a lack of time to meet the needs of all students. They may push forward regardless of whether students master material.
- Teachers report allocating time to songs and story telling, which may explain stronger performance in listening comprehension compared to other tasks.

“[Teachers] provide quality education but what I can say is it depend on the number of students. It’s difficult to provide quality education depending on the big number of children.”  
WEO, Mwanza

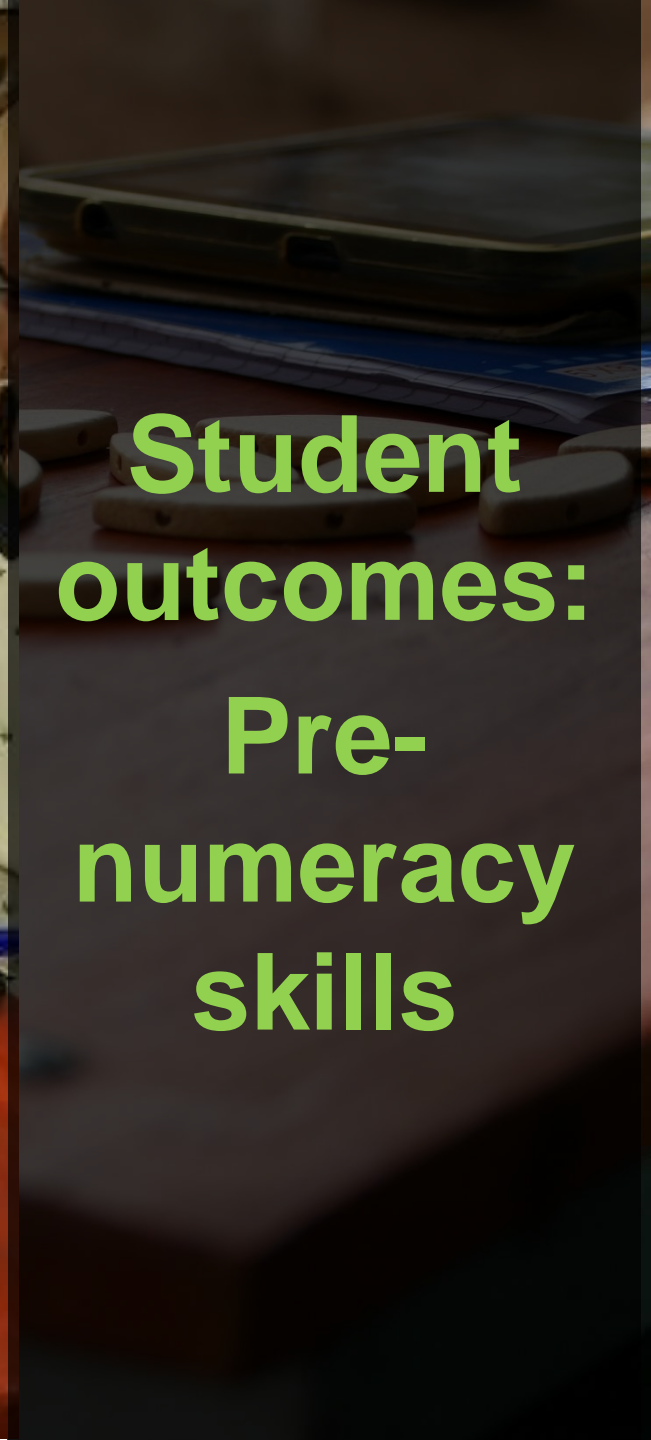
“The challenge is the environment. You may find that a student tells you that they haven’t eaten since yesterday. You have to find a way to help so that they will be attentive in class. You can buy buns ...”  
Teacher Moshi

“The challenge is the issue of absenteeism and the parents don’t understand the importance of this preprimary education.”  
Teacher Mwanza

“I use those materials depending on the topic I prepare, and many topics require materials so I must have them. I am teaching consonant letters. You must have cards that show those consonant letters, if it is vowels you must have cards.”  
Teacher Moshi







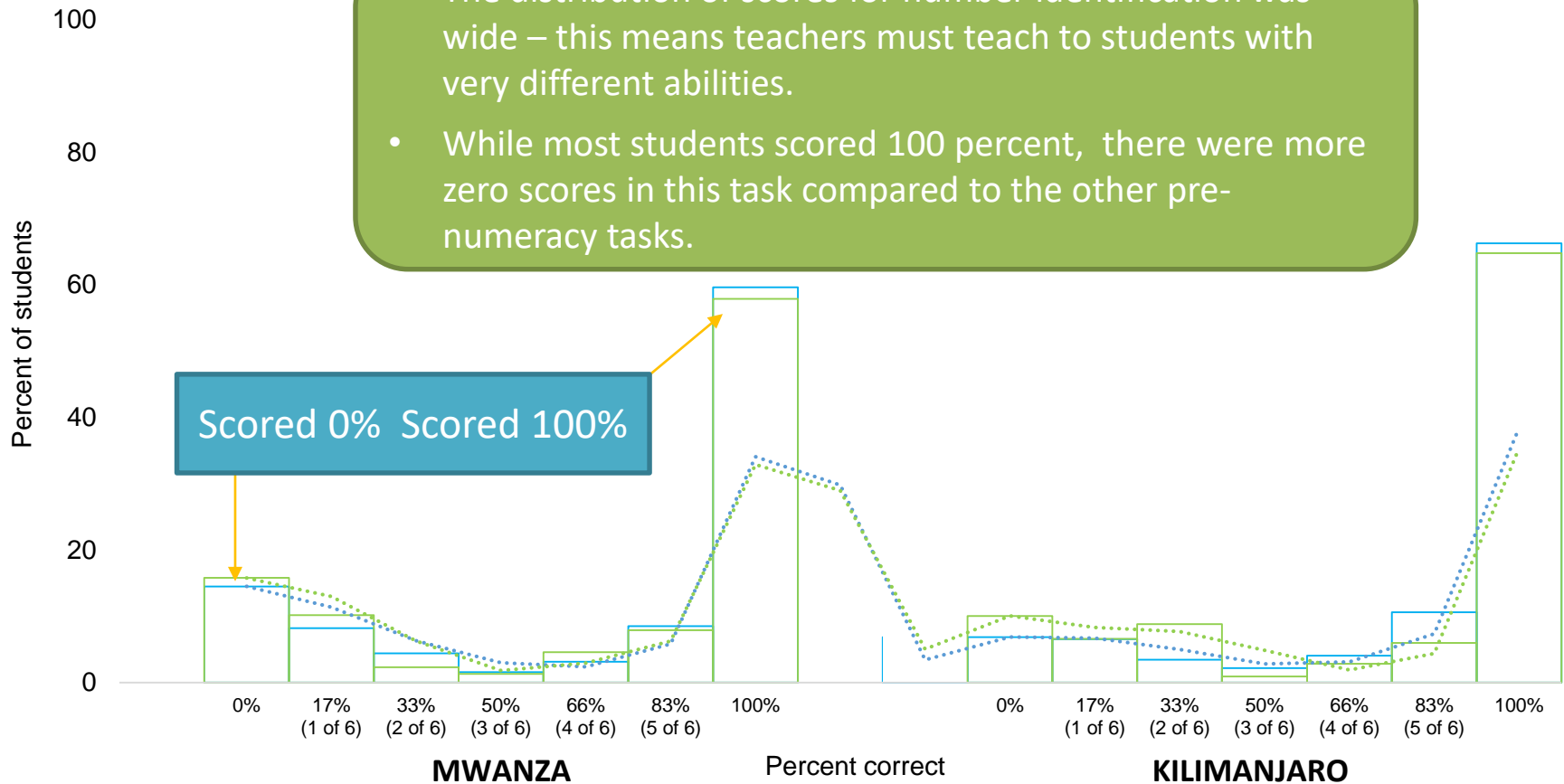
**Student  
outcomes:  
Pre-  
numeracy  
skills**

# Number identification, by region (out of 6)

Child picks the highest/lowest of two numbers

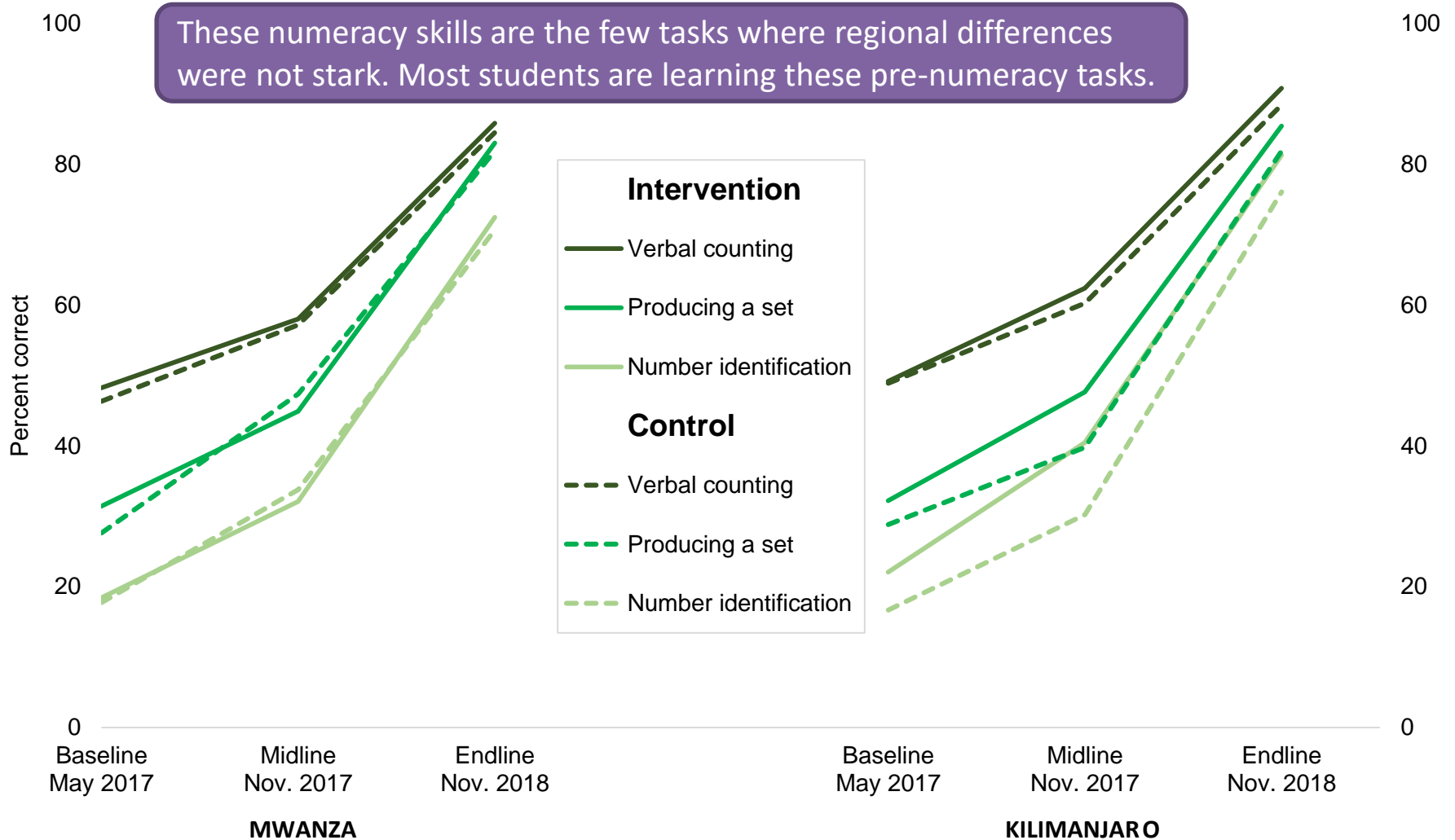
□ Intervention, by region    □ Control, by region

- The distribution of scores for number identification was wide – this means teachers must teach to students with very different abilities.
- While most students scored 100 percent, there were more zero scores in this task compared to the other pre-numeracy tasks.



# Number skills, over time, by region

## Comparing intervention and control students by region



Note: Results may differ from others shown due to sample changes. Figures show regression-adjusted means for students present and task administered at each time point, excluding those in pre-primary at endline.



# Pre-numeracy impacts by region

No impacts detected	Mwanza			Kilimanjaro		
	Intervention mean n=317	Control mean n=304	FkW impact	Intervention mean n=317	Control mean n=304	FkW impact
<b>Pre-numeracy skills</b> (percent correct)						
<b>Spatial vocabulary</b> (out of 4)	63	61	2	79	78	1
<b>Verbal counting</b> (out of 30)	86	85	1	91	88	2
<b>Producing a set</b> (out of 2)	83	82	1	85	82	4
<b>Mental transformation</b> (out of 4)	38	40	-3	45	43	2
<b>Number identification</b> (out of 6)	73	71	2	81	76	5

Randomly selected schools in Mwanza (n=65) and Kilimanjaro (n=66)

Source: Fursa kwa Watoto Learning Agenda– Student assessment data collected May 2017 and November 2019

Note: The table shows regression-adjusted means for the intervention group and control group, respectively, and the corresponding impact estimate.

# Pre-numeracy

## Qualitative findings and respondent voices

- Teachers report that pre-numeracy instruction is easier than literacy, particularly when they use learning materials. However many teachers lack sufficient learning materials for all students.
- Teachers struggle with high enrollment and learners of different abilities. With only one teacher and limited class time, they are unable to meet students diverse needs.
- Control teachers report learning instructional practices, such as using learning areas, from FkW trained teachers.
- DEOs, DAOs, WEOs, and QAOs report supporting control schools to adopt these practices.
- Teachers also report participating in the TIE teacher training, which is based on FkW approaches, and was offered to all pre-primary teachers in 2017.

“In math areas there are counters and cards that are used to help them in counting and in knowing the number of things. We have bottles, stones, and sticks which all help them in counting from one to nine. There are trays used to describe different shapes like circles, rectangles, squares and other shapes.”

Teacher, Moshi

“The challenge is I have so many students is children with different abilities. The challenge is when one child is a fast and another slow learner. What I do? I make sure I teach the uniform thing as required.”

Teacher Moshi

“There are challenges. We have a huge number of students. They do not have their own materials. The classroom is too small. So the challenges to overcome the preprimary classroom should be bigger and teachers should be given more tools and materials.”

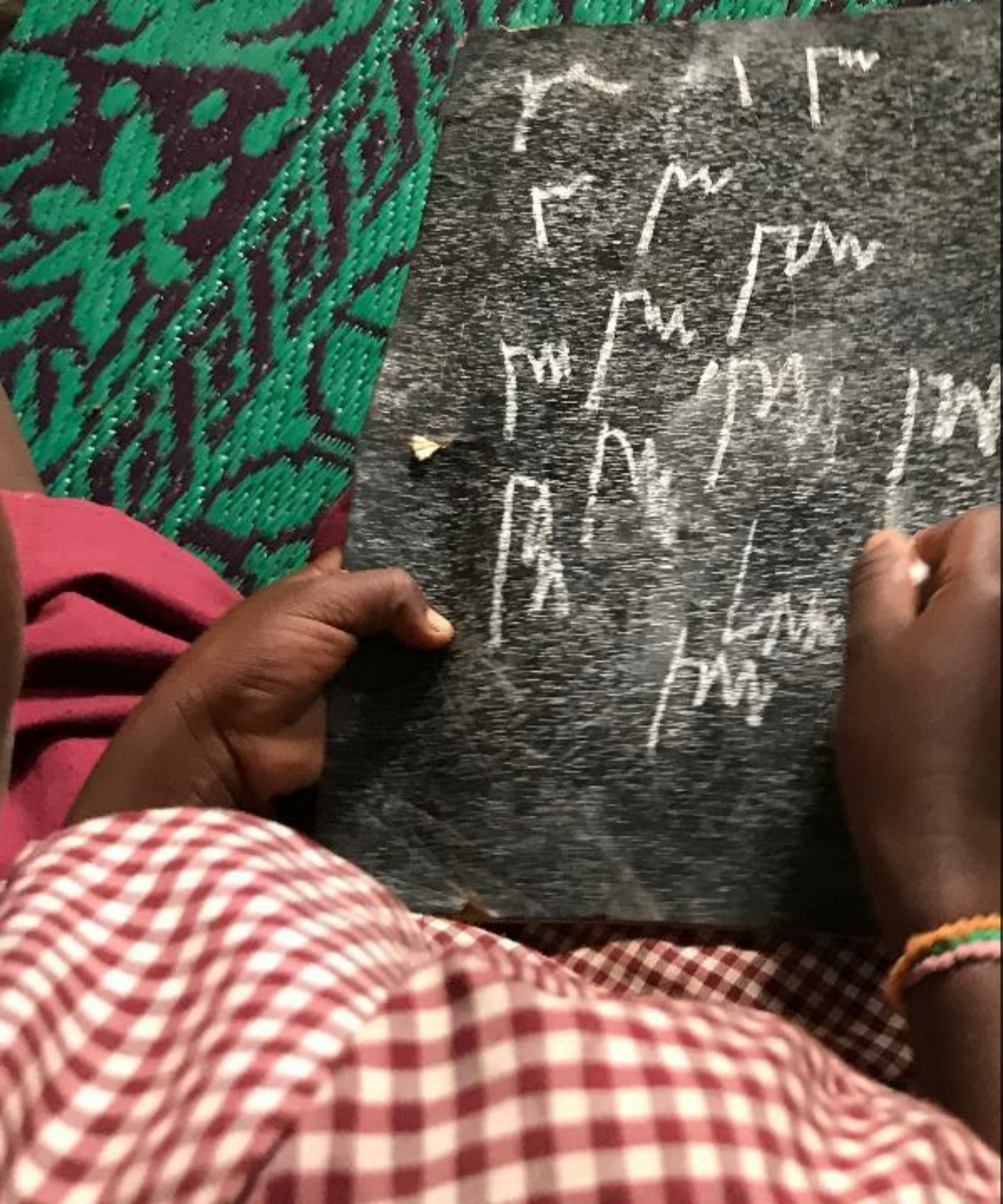
Teacher Mwanza

“Yes the teacher who was trained (FkW) brought changes. I was teaching the old way, just the way I used to know. But he came to teach me even how to say out these letters, so he helped me a lot.”

Teacher Mwanza







**Student  
outcomes:  
Early grade  
math**



# Early grade math impacts by region

<b>No impacts detected</b>	<u>Mwanza</u>			<u>Kilimanjaro</u>		
	Intervention mean n=317	Control mean n=304	FkW impact */**	Intervention mean n=317	Control mean n=304	FkW impact */**
<b>Early grade math skills</b> (percent correct)						
<b>Number discrimination</b> (out of 6)	40	42	-2	42	39	3
<b>Word problems</b> (out of 7)	17	19	-2	22	19	3
<b>Addition</b> (out of 20)	20	22	-2	24	22	2
<b>Subtraction</b> (out of 20)	15	16	-1	19	18	2

Randomly selected schools in Mwanza (n=65) and Kilimanjaro (n=66)

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# Early grade math

## Qualitative findings and respondent voices

- The gains in pre-numeracy from pre-primary to Standard 1 (despite no FkW impacts) suggest that students would quickly acquire the early grade math skills if they had well trained teachers, adequate classrooms, and sufficient learning materials.
- Most respondents describe how teachers struggle to teach foundational and more complex skills in resource poor schools with congested classrooms.

“...preprimary education is unable to succeed. Its success is minimal because of the infrastructure as well as resources. We do not have funds to manage preprimary education, therefore it is not effective..” Head Teacher Mwanza

“I am still struggling because these classes are supposed to be taught by two teachers. It is difficult for me sometimes. Today I was teaching and a child got sick. You find that sometimes the children fight and sometimes they play, so there should be another teacher teaching the class.”

Teacher, Moshi

“The policy (no contributions) has just removed key activities (feeding program). It makes us teach faster so that we dismiss kids early to go home for breakfast before the period ends. And considering their huge number, we find it impossible to make even three quarters of the class understand the lessons with that limited time. Sometimes we just ignore understanding, we just teach them.”

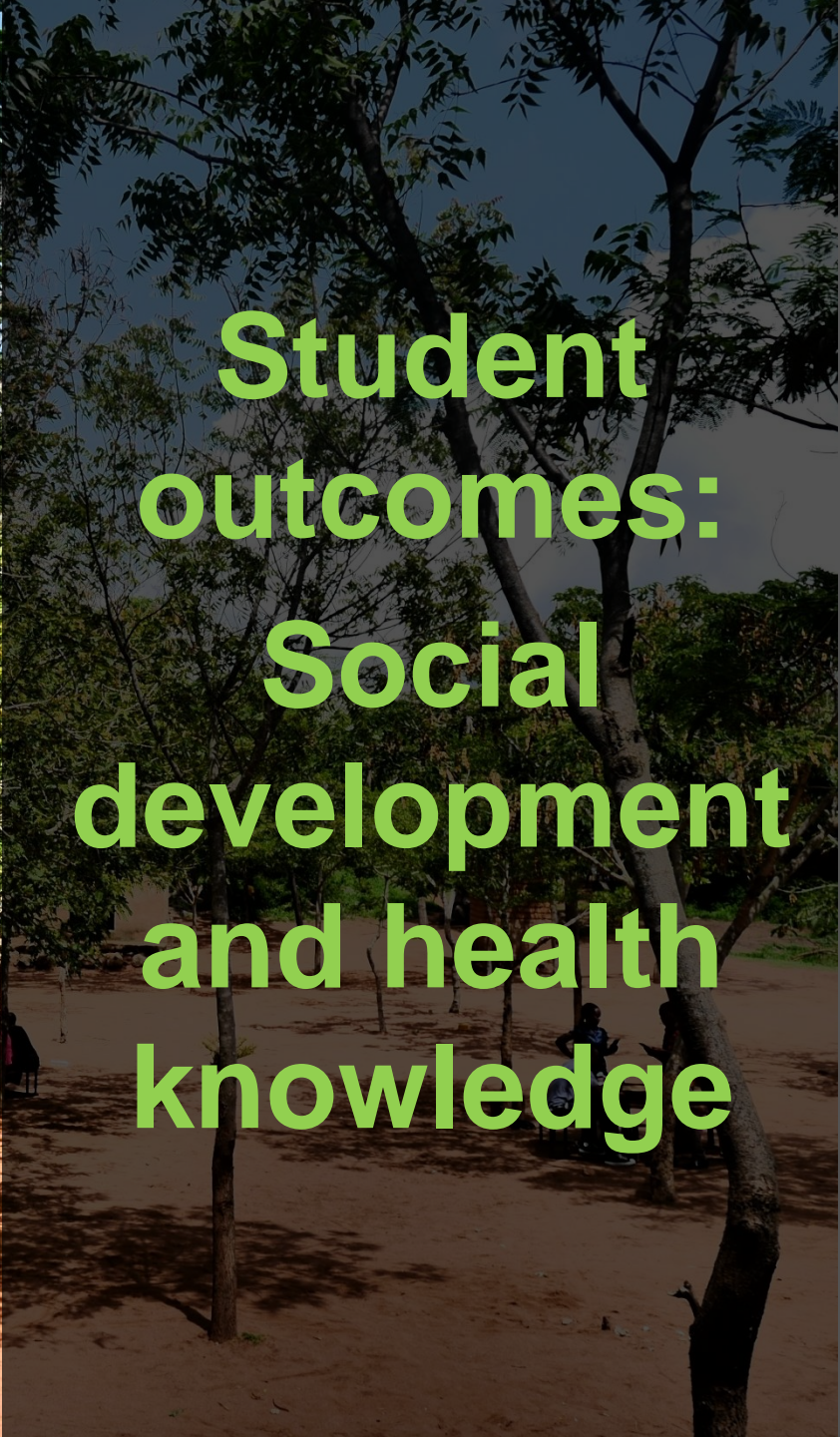
Teacher Mwanza

“Like I told you, pupils are coming early in the morning, they start crying out of hunger even before 9:00 am. Kids can't study with empty stomachs. The work becomes harder and the goals cannot be reached.”

Teacher Mwanza





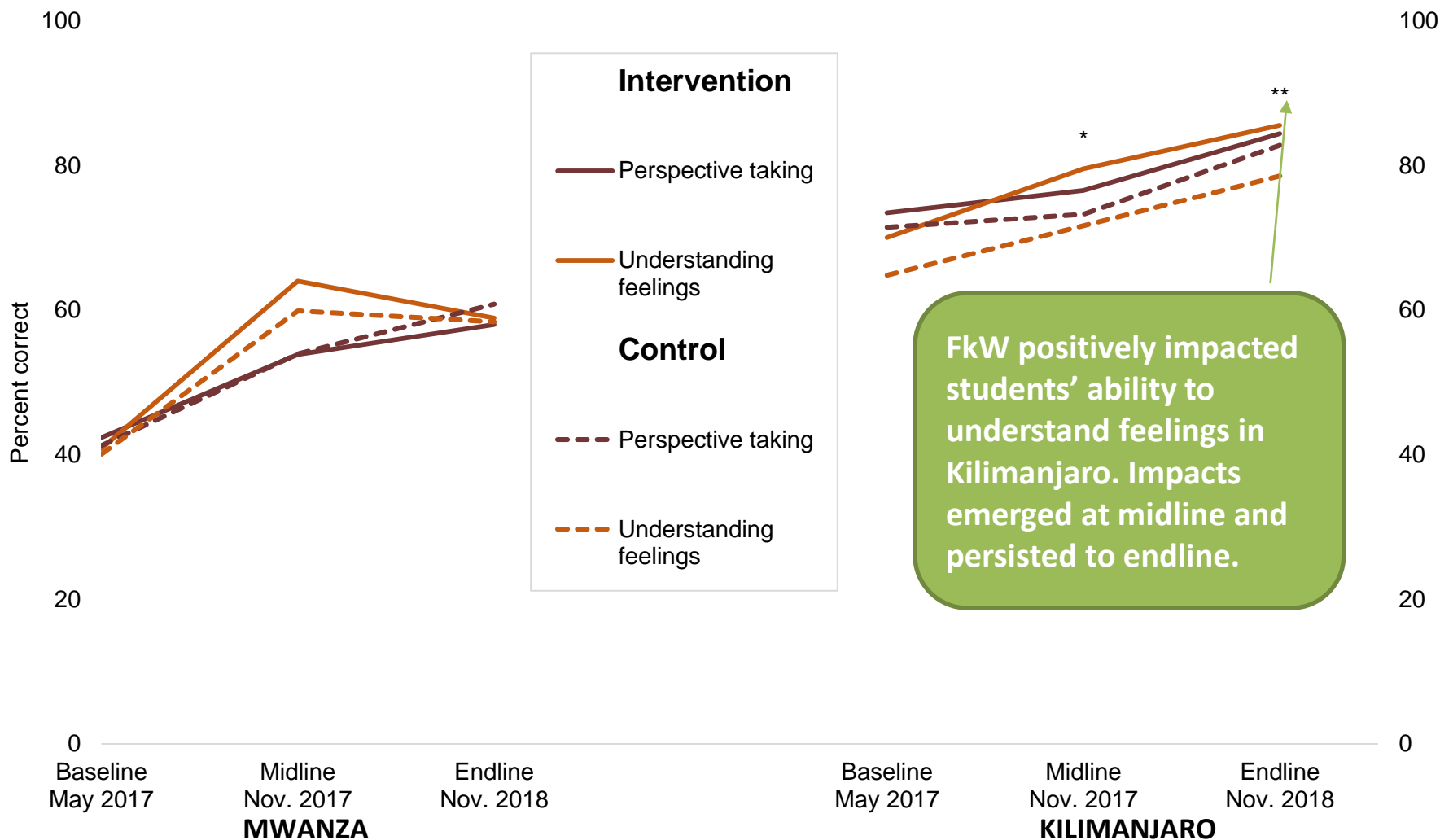


**Student  
outcomes:  
Social  
development  
and health  
knowledge**



# Socio-emotional skills, over time, by region

Comparing intervention and control students by region



Note: Results may differ from others shown due to sample changes. Figures show regression-adjusted means for students present and task administered at each time point, excluding those in pre-primary at endline.

# Socio-emotional skills & health knowledge impacts by region

	<u>Mwanza</u>			<u>Kilimanjaro</u>		
	Intervention mean n=317	Control mean n=304	FkW impact (Intervention- Control) */**	Intervention mean n=317	Control mean n=304	FkW impact (Intervention- Control) */**
<b>Socio-emotional skills</b> (percent correct)						
<b>Perspective taking</b> (out of 3)	58	61	-3	84	83	2
<b>Understanding feelings</b> (out of 2)	59	58	1	86	79	7**
<b>Health knowledge</b> (percent correct)						
<b>Caring for health</b> (out of 2)	64	71	-7	72	68	4
<b>Identifying nutritious food</b> (out of 1)	52	52	1	76	68	8

Randomly selected schools in Mwanza (n=65) and Kilimanjaro (n=66)

Source: Fursa kwa Watoto Learning Agenda– Student assessment data collected May 2017 and November 2019

Note: The table shows regression-adjusted means for the intervention group and control group, respectively, and the corresponding impact estimate.

# Social emotional and health

## Qualitative findings and respondent voices

- FKW trained teachers report that student behavior and interactions have improved since implementing participatory approaches, circle time, and learning areas.
- Teachers also describe developing closer relationships with students and that positive relationships enable children to develop stronger social emotional skills.

“Frankly, if you look at pre-primary children’s behavior, they resemble those of standard one. They are well disciplined. The pre-primary students trust their class teacher and HT.”

Head Teacher Mwanza

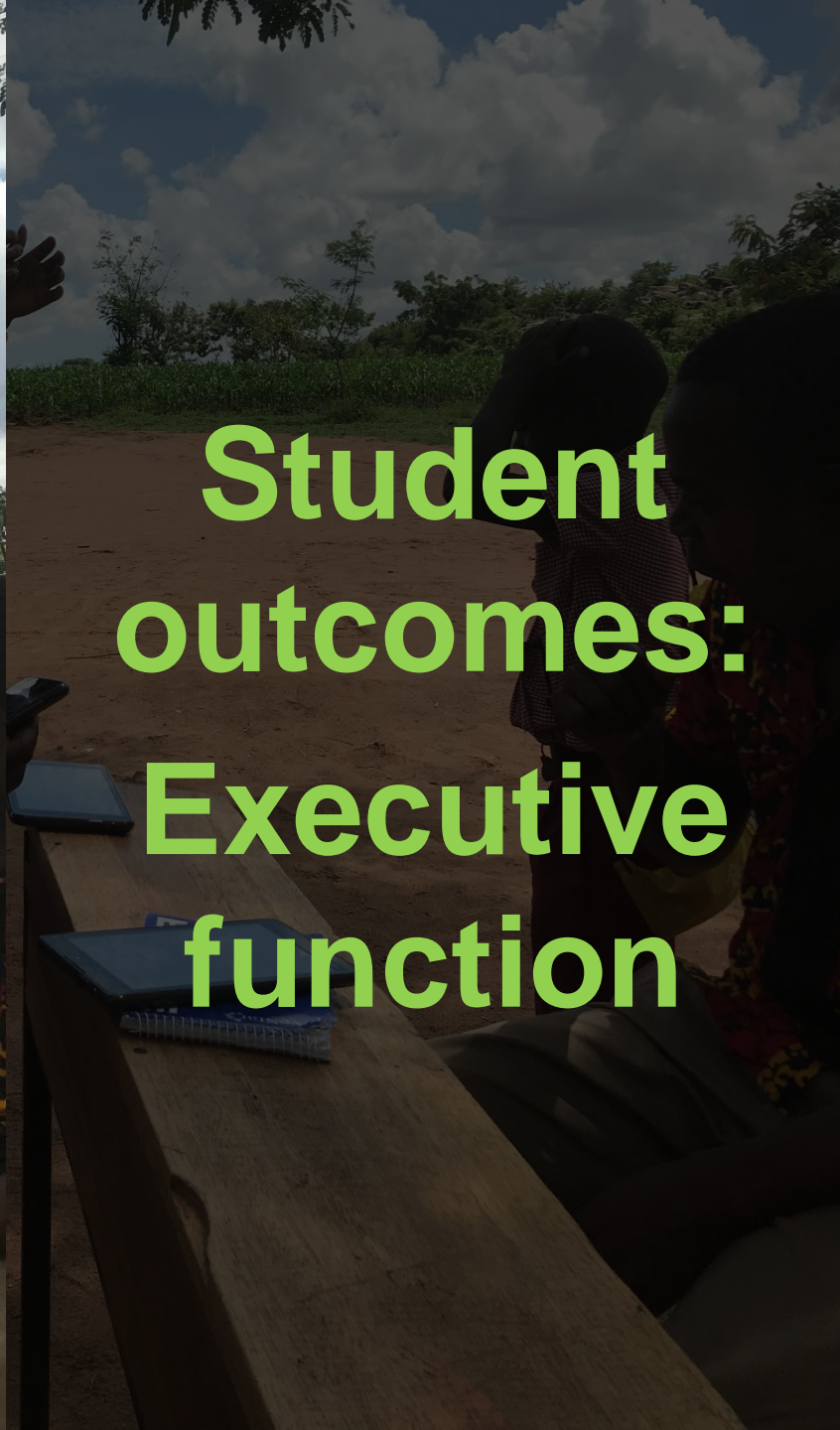
“I used to receive those children and they were very rude and they did not care. But as they came and started learning they started appreciating that ‘oh the classroom is a place to be well behaved’...” Teacher Mwanza

“In these trainings (FkW) they even change us teachers. Now, we mostly use materials in the class. In the past where we were just going to class without anything. Now we use materials more and the children love learning together.” Teacher Moshi

“The teaching strategies... first you have to love these children and listen to them. In turn they would love you. They need to be listened to. You only need to be close to them to ensure that they don’t cross the line. This builds a good relationship with them. When you want to teach you create a cooperative bond..” Teacher Moshi



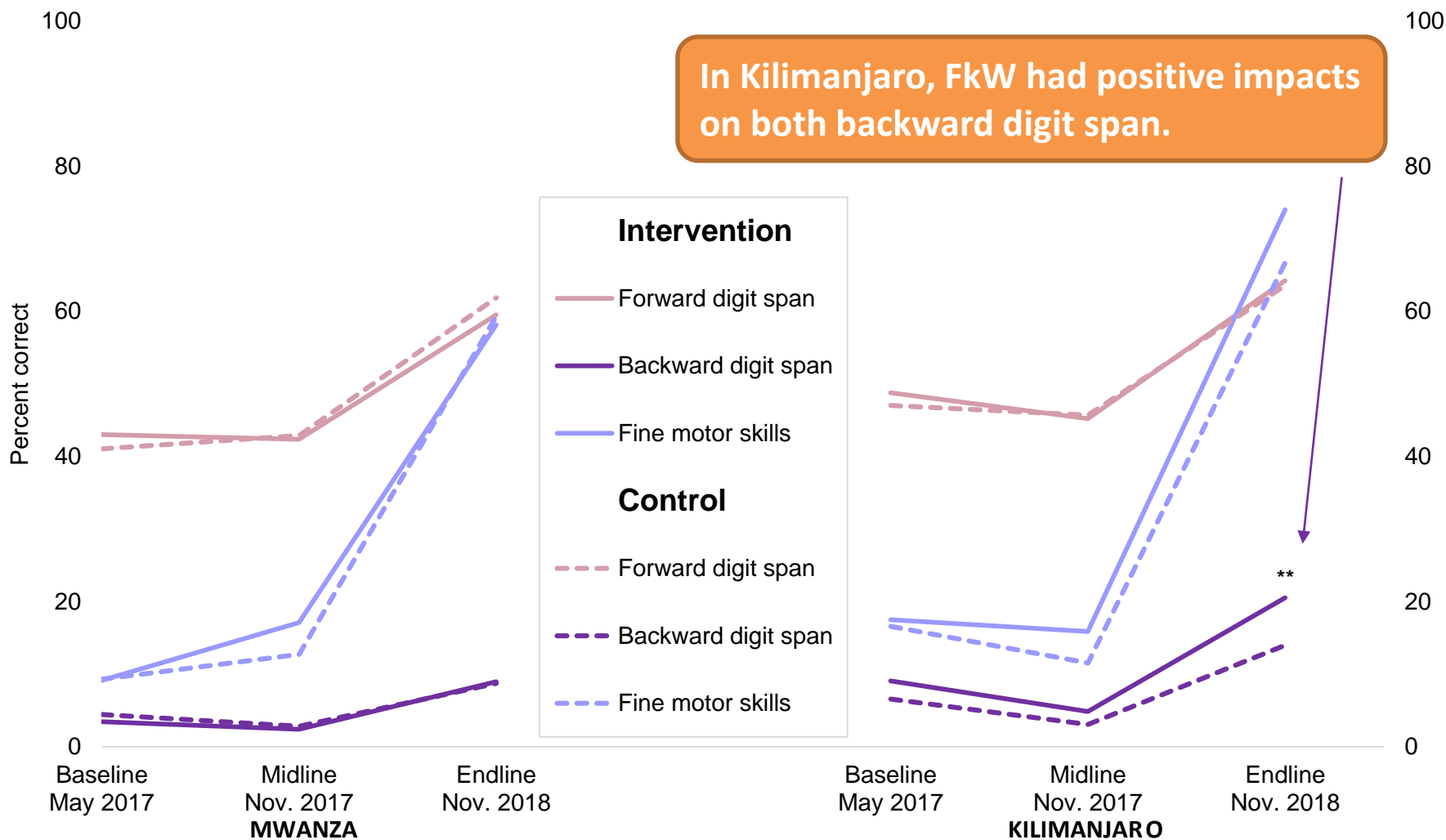




**Student  
outcomes:  
Executive  
function**

# Executive function, over time, by region

Comparing intervention and control students by region



\* Between-group differences are statistically significant at the .05 level  
 \*\* Between-group differences are statistically significant at the .01 level.

# Executive function impacts by region

	<u>Mwanza</u>			<u>Kilimanjaro</u>		
	Intervention mean n=317	Control mean n=304	FkW impact	Intervention mean n=317	Control mean n=304	FkW impact
<b>Executive function</b> (percent correct)						
<b>Forward digit span</b> (out of 3)	58	62	-4	61	61	0
<b>Backward digit span</b> (out of 7)	8	8	0	19	12	<b>6**</b>
<b>Fine motor skills</b> (out of 6)	57	59	-2	71	65	6

\*, \*\*, \*\*\* Statistically significant at  $p < .05$ ,  $p < .01$ ,  $p < .001$

Randomly selected schools in Mwanza (n=65) and Kilimanjaro (n=66)

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# Executive function

## Qualitative findings and respondent voices

- Respondents both feel pride in the differences caused by FkW and also lament the serious challenges to implementing quality pre-primary in the current context.
- Respondents describe how congestion and an impossible pupil to teacher ratio are preventing significant achievement.
- Respondents are grateful that FkW has “spilled over” to control schools but note that resource shortages prevent full implementation.

“There is no class that has met the ministry criteria of 25 children in the pre-primary classroom. All classes start from 50, 60, 70, 80 and so on. We still have that challenge.”  
DEO

“Congestion is still a huge issue affecting our district. People have come in large numbers for enrollment. We exceeded the target. We increased enrollment more than 100%.”  
DEO

“Tools are not enough. Before, we started with few students but now the classroom has a lot of students. When I started teaching preprimary, we started with 25 and they came to be 40, and then 50 and then 60 but now I have 167 students so materials are few.”  
Teacher Moshi

“The grant that we get is not adequate so we cannot buy tools for all of them. I think there should be a specific grant allocated to the pre-primary class, this would be very helpful.”  
Head Teacher Moshi

“...The shortage of teachers and the big number of children. We are hindered by that shortage of teachers. The other thing is teaching materials in relation to a big number of children. You find materials do not satisfy children’s requirements.”  
Head Teacher Mwanza



# Summary of results:

## Student learning and development outcomes

- In Kilimanjaro FkW positively impacted:
  - **Name writing**
  - **Understanding feelings**
  - **Executive function**
- In Mwanza, there were no statistically significant impacts
- Students demonstrated the strongest gains in pre-numeracy, likely because students learn number skills more easily with counters and other learning materials.
- Given that district officials recognized the value of FkW and tried to implement practices in control schools, spillover of FkW to control schools may have improved student outcomes among students in both intervention and control schools.

