EdTech as **Supplemental** Learning in Two Tanzania RCTs

March 14, 2024

Imagine Worldwide
Karen Levesque
Sarah Bardack
Abraham Bahlibi

International Rescue Committee
Silvia Diazgranados

A growing body of research has established the effectiveness of EdTech interventions in developing contexts
(McEwan 2015; Glewwe & Muralidharan 2016; Conn 2017; Rodriguez-Segura 2021)

- Research conducted in Africa since 2013 has shown that high-quality, tablet-based instruction can produce meaningful impacts on learning in both in-school and out-of-school settings
  (Pitchford 2015; Pitchford et al. 2017; King et al. 2019; Levesque et al. 2020; Levesque et al. 2022)

- Recent studies have also indicated positive impacts of EdTech in informal schools in refugee settings
  (Bardack et al. forthcoming)

- While children from under-resourced communities have been shown to be more vulnerable to learning loss during school breaks, we know little about whether EdTech interventions can effectively offset "summer learning loss" in refugee settings
  (Cooper et al. 1996; Slade et al. 2017)

- And there is little evidence about the learning impacts of EdTech in adjacent host communities

Objectives: To fill the gap in knowledge about how EdTech may
- help avoid learning loss between school years in a refugee setting
- contribute to learning impacts in adjacent host communities

Primary research questions – today's focus

What are the **learning impacts** of using a high-quality, tablet-based literacy and numeracy curriculum?
1. What is the impact on literacy and numeracy outcomes of using a high-quality tablet-based software for 1 hour/day, 5 days/week
   - over normal school break activities in the refugee camp?
   - over standard school instruction in the nearby host community?
2. What impact does attendance have on learning outcomes?

Kigoma Region, Tanzania

- Nyarugusu Refugee Camp School
  - Serving refugees form the DRC

- Kigoma Region Host Community School
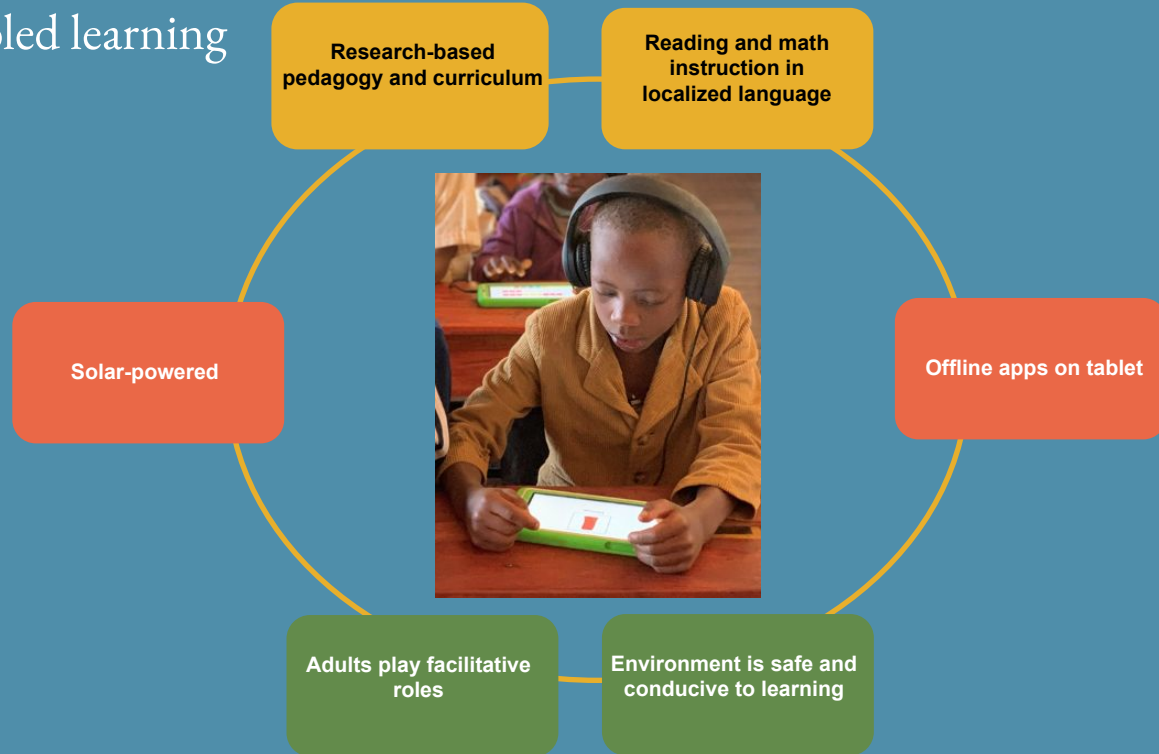 - Serving Tanzanian children

Child-centered, technology enabled learning

- Offered as **supplemental** instruction in the official language of instruction in the school
- Learning centers located on school campuses
- Tablet sessions offered **1 hour/day** with a goal of 40 minutes of time on task
- Children drive their own learning through **personalized** learning pathways
- Adults play a **facilitative** role
- Teaching is done through engaging, research-based software that is **offline**
- Tablets are charged using **solar-charged** batteries

Research-based pedagogy and curriculum

Reading and math instruction in localized language

Solar-powered

Offline apps on tablet

Adults play facilitative roles

Environment is safe and conducive to learning

onebillion's *onetab*

- Co-winner of the 2019 Global Learning XPrize
- Teaches foundational literacy and numeracy
- In Kiswahili (also Chichewa, English, and French)
- Avatar talks and demonstrates (direct teaching)
- Adaptive
  - begins with a short diagnostic assessment that then delivers instruction at the right level
  - proceeds to next subject
  - then children can use the Library or Playzone
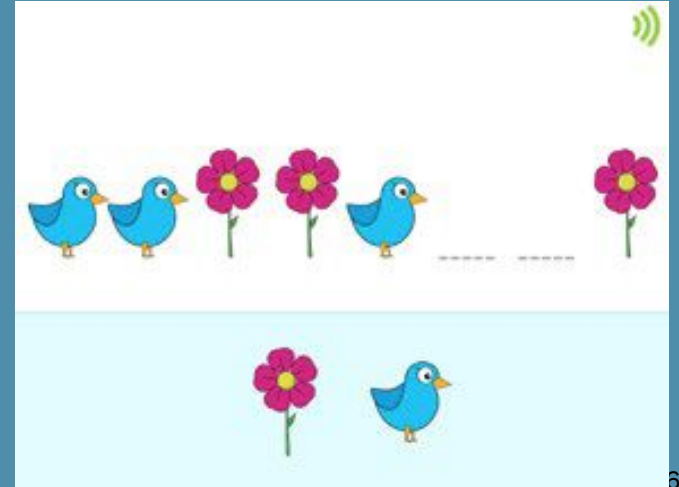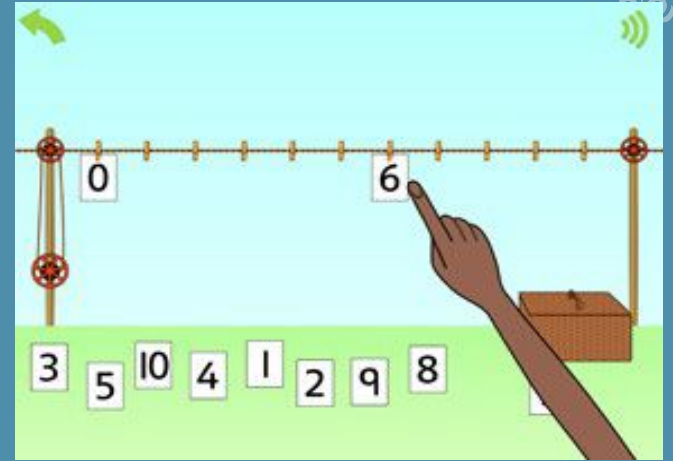
- Two **independent RCTs** at purposively selected school sites

- Each using a stratified, **individual random assignment** design

  - **300 learners** were randomly assigned to treatment and control groups within grade (1,2,3) and gender (male, female) strata at each site

- The **treatment groups** used the software in Kiswahili during 1-hour tablet sessions offered daily outside of normal school hours

  - Camp: School break, 8 weeks

  - Host: After school, 5 months

- The **control group** continued with

  - In the camp: Normal school break activities (e.g., English tuition, home tutoring, 4th grade exam preparation, TV incl. Ubongo, radio incl. teaching programs, religious lessons, playground)

  - In the host community: Standard school instruction only

Baseline and endline assessments in Kiswahili (adapted for camp) (IPA)

- **Early Grade Reading Assessment (EGRA)**
- **Early Grade Math Assessment (EGMA)**
- Child survey
- TZ Life Skills Assessment (academic grit, self control)
- Facilitator survey
- Stakeholder interviews (adults and children)

Administrative data (IRC)

- Digital daily attendance logs
- Termly tablet usage data

Regular monitoring

- Weekly program monitoring visits (IRC)
- Biweekly research monitoring visits, including session observations (IPA)

Termly qualitative research visits (UDSM)

- Child participant interviews, session observations, adult stakeholder interviews

Primary outcome measures

- EGRA average % correct (literacy)

- EGMA average % correct (numeracy)

Impact analyses

- **Intent-to-Treat (ITT):** impact of being assigned to intervention, relative to being assigned to control

- **Treatment-on-the-Treated (TOT):** impact of attending the intervention at least 50% of the program days, relative to attending the intervention fewer or no days

- Regression models include

  - Fixed effects for the gender-grade category strata

  - Baseline covariates for gender, grade, relevant outcome measure, opposite-subject outcome measure

Final analytic sample

- 95-96% persistence in study

- Baseline equivalence satisfied

Some Contextual Differences

Characteristic	Camp	Host
Program duration	8 weeks	5 months
Delivery	During school break	After school
Baseline EGRA (literacy)	20% correct	11% correct
Baseline EGMA (numeracy)	40% correct	15% correct
Spoke some Kiswahili at home	92%	43%
Reading materials in home	38%	19%
Receives homework help	44%	79%

Learning gains: Camp effect sizes after 8 weeks
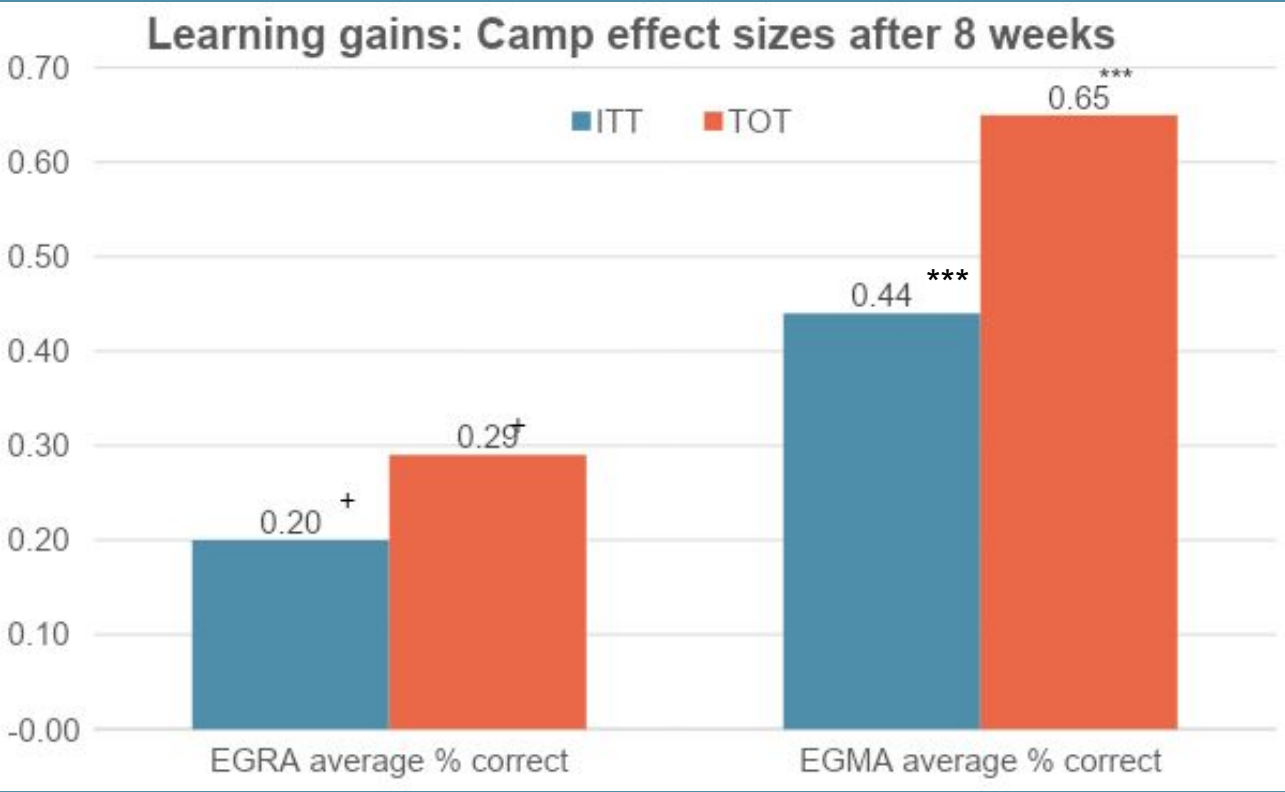
Learning gains: Host effect sizes after 5 months
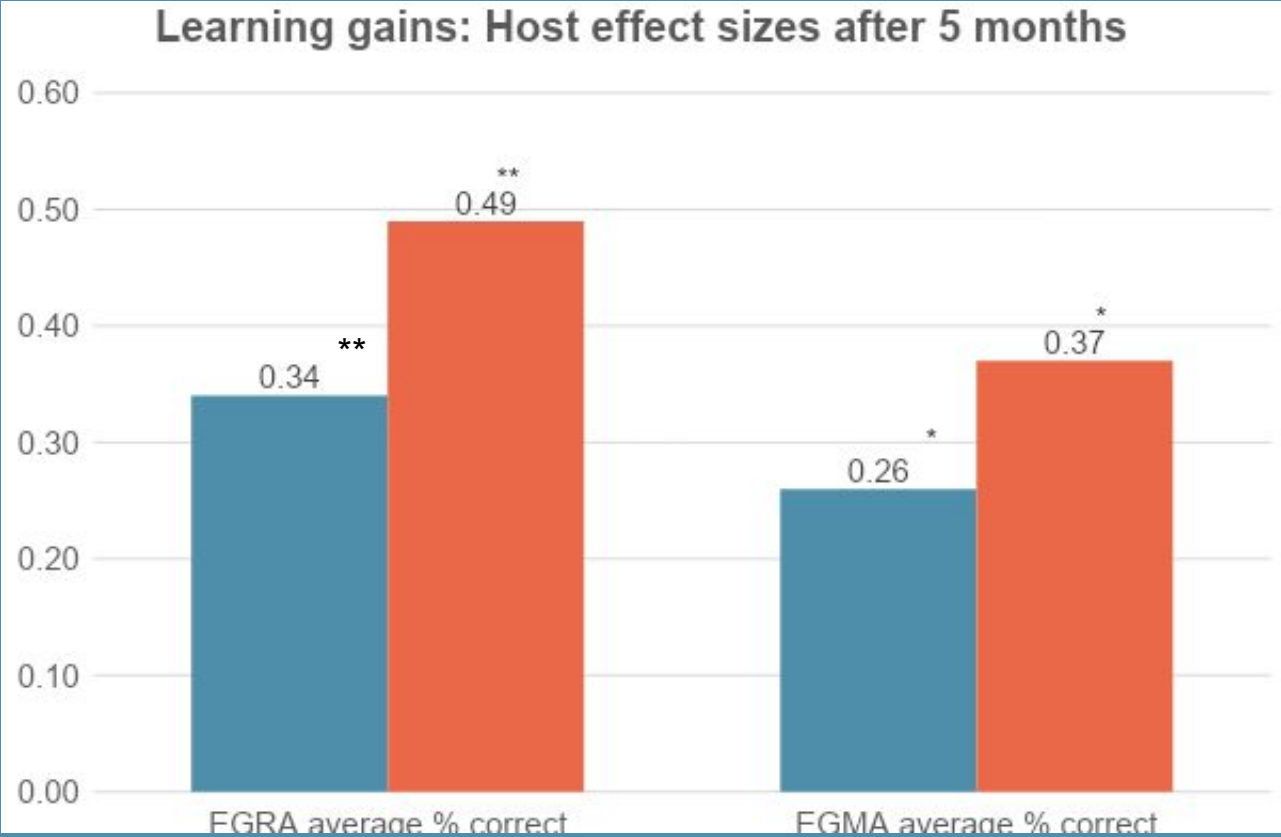
Impacts

- Both RCTs produced statistically significant impacts in both literacy and numeracy
  - Despite lower-than-planned time on task (8 weeks / 5 months vs. 6 months)
  - And despite apparently different initial educational advantages in the two sites
- The two studies contribute to a substantial body of evidence on onebillion's software
  - 9+ RCTs to date have consistently shown positive learning impacts in different countries, languages, and settings

The future

- onebillion continues to develop and improve its software and is open to feedback
- They have made the software available for free to the project
- The Tanzania Ministry of Education is considering expanding the program nationwide
- And the Malawi government has begun rolling out the program to all primary schools

Stay connected with Imagine

Follow us on social media or sign up for our newsletter

imagineworldwide.org

karen.levesque@imagineworldwide.org