EDUCATION IN ETHIOPIA

Raising Test Scores for the Lowest-Scoring Students

Applied Policy Project
Sarah Boches

Table of Contents

ACKNOWLEDGMENTS

DISCLAIMER

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy, University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degrees. The judgements and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other agency.

UNIVERSITY OF VIRGINIA HONOR CODE

On my honor as a student, I have not given nor received unauthorized aid on this assignment.

Sarah Boches

Cover Page Image Credit: United Nations Institute for Training and Research. (2016). Education for Climate Change in Ethiopia: The Government Leads a Discussion on Priorities for the Climate Resilient and Green Economy Strategy. Retrieved April 5, 2024, from UNITAR website:

ACRONYMS

AEP: Accelerated Education Program
EDRMC: Ethiopia Disaster Risk Management Commission
EGMA: Early Grades Mathematics Assessment
EGRA: Early Grade Reading Assessment
EHRC: Ethiopian Human Rights Commission
IOM: International Organization for Migration
MoE: Ministry of Education
OOSC: Out of School Children
RFI: Request for Information
SD: Standard Deviation
TaRL: Teaching at the Right Level
TPLF: Tigrayan People's Liberation Front

Executive Summary

Violent conflict and environmental challenges have severely hindered Ethiopia's education system leaving thousands of schools destroyed and millions of children out of school. Even prior to the onset of the crisis, ninety percent of primary school aged students are not proficient in reading. Educational interventions are needed to raise test-scores for Ethiopia's lowest scoring students. This paper provides background information on the Ethiopian school system in addition to a root cause analysis of the problem such as violent conflict and environmental challenges. The paper then includes a synthesis and analysis of current educational interventions and their effectiveness using case studies.

Three policy options for improving test scores for the lowest-scoring children in Ethiopia are explored:

1. Accelerated Education Programs
2. Targeted Learning Instruction
3. Psychological Support to Student

The criteria used to evaluate these policy options include effectiveness, cost, cost-effectiveness, and feasibility.

This paper's final recommendation is to expand *Alternative 1: Accelerating Learning Programs and implement Alternative 2: Targeted Learning Instruction Programs in the Tigray Region*. The Tigray Region is specificized as it was one of the most heavily damaged regions because of the Tigray War. Analysis suggests that these two alternatives will result in the largest increase in student test scores for the lowest-scoring students, while also targeting out of school children and increasing enrollment.

PROBLEM STATEMENT

In 2020/2021, 29% of children aged 7-14 were out of school in Ethiopia. These numbers have likely increased sharply since then due to subsequent recurrent crises of conflict, drought, and other natural and man-made disasters across the country. Ninety percent of children in Ethiopia of late primary school age today are not proficient in reading, this number does not account for late primary school age children not in school. In particular, the lowest performing students do not experience pathways to learning foundational skills. Success of policy alternatives will be measured on learning gains for these lowest performing children.

CLIENT OVERVIEW AND EXPLANATION

Founded in 1975, Chemonics International is a leading global sustainable development firm whose mission is to "promote meaningful change around the world to help people live healthier, more productive, and more independent lives" (Chemonics International, 2022). Specializing in over 12 technical areas, Chemonics's services in education seeks to advance quality education, provide policy reform assistance, and prepare young people for the workforce.

As one of USAID's largest contractors, Chemonics is currently assembling information for a Request for Information (RFI) provided by USAID. USAID and the Ethiopian government are interested in several questions such as evidence-based pedagogies, evidence-based caregiver and community support, capabilities for coordination between federal and regional levels to address education in emergencies, and more. Provided in the RFI is USAID's Theory of Change, a written description of the strategies, actions, conditions, and resources that facilitate change and achieve outcomes ("What Is Theory of Change?" 2024). The Theory of Change is as follows:

> IF Ethiopian federal and regional education systems are equipped to support learning during and after crises AND schools and educators provide safe, joyful, evidence-based foundational skills instruction AND communities and caregivers support children's learning and wellbeing during and after crises THEN the most vulnerable children will gain holistic foundational skills, even when coping with crises and their aftermath (RFI, 2024).

In accordance with the Theory of Change, this paper will focus on uncovering evidence-based pedagogies to target low-performing students in crisis-affected settings in Ethiopia.

Background

Education in Ethiopia

The academic year in Ethiopia is from September to July, with the official entry age for primary school being 7 years old. The educational framework is designed such that primary schooling spans 6 years, lower secondary education extends over 4 years, and upper secondary education spans 2 years. Figure 2 demonstrates the number of children in school by grade level in 2018 (the most recent breakdown available). Figure 3 illustrates the educational attainment of Ethiopian youths aged 15-24 in 2018. While some individuals in this demographic may still be pursuing their educational objectives, it is significant to observe that around 16% of them lack formal education, and 54% have achieved, at most, incomplete primary education. This indicates that a combined total of 70% of youths aged 15-24 in Ethiopia have not finished primary schooling ("School Entrance Age: Duration and Official Ages for School Cycle," 2018).

Figure 1: Education System

School Entrance Age:

Primary school - Age 7

Duration and Official Ages for School Cycle:

Primary :   6 years - Ages 7 - 12

Lower secondary :   4 years - Ages 13 - 16
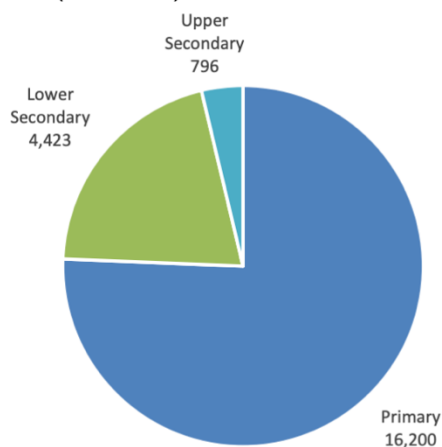
Upper secondary :   2 years - Ages 17 - 18

Academic Calendar:

Starting month :   September
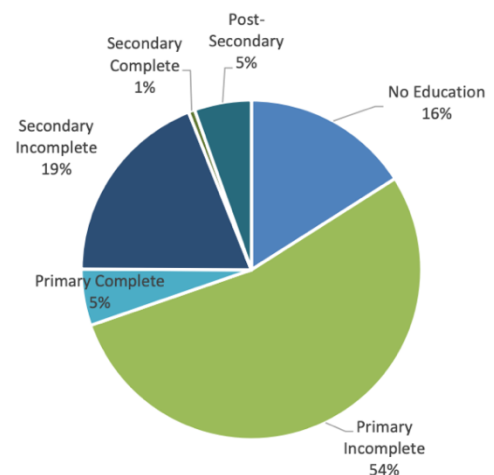
Ending month :   July

Data source: UNESCO Institute for Statistics

Figure 2: Number of Pupils By School Level (in 1000S)

Data Source: UNESCO Institute for Statistics 2015-2017

Figure 3: Education Attainment, Youth Ages 15-24

Data source: EPDC extraction of DHS dataset   2016

Environmental Challenges

Ethiopia is facing its worst drought in recent history. Over 24.1 million individuals (12.6 million of which are children) have been affected by drought ("Increasing Number of Children Pushed out of Education in Ethiopia due to Severe Drought, Conflict and Forced Displacement - Ethiopia", 2022), with 6.8 million livestock deaths since 2021, livelihoods are being threatened ("Ethiopia: Drought Snapshot - 4 April 2023 - Ethiopia", 2023). Large-scale population movement is often used to alleviate the effects of climate challenges. According to data collected by the International Organization for Migration (IOM), over 800,000 individuals were internally displaced due to drought between November 2022 and June 2023; and according to the Ethiopia Disaster Risk Management Commission (EDRMC), an additional 1.1 million people have been impacted by floods and landslides. These displacements are frequently uncoordinated, involuntary, and hazardous, resulting in humanitarian and protection concerns ("Faces of Climate Displacement in Ethiopia" 2023).

According to the World Food Programme, as many as 20 million people are at risk of starvation and need food assistance. Family mealtimes in many Ethiopian households have dropped from three per day to just one (Bollemeijer, 2022). Additionally, the conflict in Ukraine has led to a jump in prices for commodities like fuel and fertilizer, as well as agricultural products such as wheat, maize, and sunflower oil. This loss of supplies from Ukraine, which serves as the largest grain and fertilizer provider for Ethiopia, poses a significant disaster, exacerbating food insecurity in the region (Bollemeijer, 2022).

Violent Conflict

Ethiopia has been embroiled in continuous violent conflict since 2020. From 2020 to 2022, Ethiopia engaged in a conflict with militants from its northernmost region of Tigray, which was then governed by the Tigrayan People's Liberation Front (TPLF). Marked as one of the deadliest conflicts in recent global history, it garnered widespread international scrutiny due to numerous allegations of war crimes, human rights violations, and ethnic cleansing within Tigray. The conflict formally concluded in November 2022 with the signing of the Pretoria agreement (Center for Preventive Action, 2021). In 2021 alone, 5.1 million Ethiopians became internally displaced, a record for the most people internally displaced in any country in any single year at the time. Thousands were also forced to flee to Sudan and other countries in the region. The Tigray War and subsequent humanitarian disaster had killed approximately 600,000 people by the time the Pretoria agreement took effect. In late 2022, humanitarian groups were permitted to meaningfully operate in Tigray for the first time since November 2020 (Center for Preventive Action, 2021).

Less than a year after the signing of the Pretoria peace deal conflict erupted once again. Fighting began in April 2023 between the Fano militia group and the Ethiopian government. Fano militiamen initially joined forces with the Ethiopian army to combat Tigrayan forces; however, this relationship swiftly deteriorated. A contributing factor was the peace agreement, which numerous individuals in Amhara criticized for neglecting to address their apprehensions regarding security threats originating from Tigray and an adjacent region, Oromia. Post-war, the central government initiated a crackdown on regional security forces, aiming to bolster centralized military control and address ethnic tensions in both regions. By late 2023, the central government intensified military actions in Amhara, while attempts at peace negotiations with the largest Oromo

militia failed for the third time (Reuters, 2024). Originally declared in August, Ethiopia's parliament extended a state of emergency by four months.

In February, Ethiopia's parliament extended the state of emergency declared in August by an additional four months to address the insurgency. The current conflict has resulted in hundreds of deaths and drawn accusations of widespread human rights abuses. The Ethiopian Human Rights Commission (EHRC), appointed by the state, has recorded various alleged abuses in the Amhara conflict, with the majority being attributed to government forces. In October, the EHRC reported that dozens of citizens have been killed because of house-to-house searches and drone strikes conducted by government forces (Reuters, 2024).

Low Student Enrollment

Financial hardship is a primary contributor to low enrollment, with financial difficulty amplified by environmental challenges, violent conflict, and displacement. Table 1 demonstrates that having no money to pay for school was the leading cause (40%) of primary school dropouts among children in Accelerated Education programs. These results are statistically different from children enrolled in Government.

Table 1: Most Important Reason for Stopping School (percentage)

	Speed school	Government school	Link schools	Statistically different
I was not doing well at school	**0.8**	**7.4**	5.0	YES
I had to work to earn money	12.5	12.5	12.9	NO
I was frequently punished at school	**0.0**	**2.2**	2.5	YES
I was frequently sick	11.7	11.8	11.4	NO
My family had no money to pay for school	**40.8**	**30.9**	30.2	YES
I had to help with housework	10.8	12.5	16.8	NO
I started a family of my own	18.3	17.7	16.3	NO
Others (Specify)	5.0	5.2	5.0	NO

Source: Akyeampong et al. 2018

Therefore, a vital aspect of any alternative will be helping offset the financial costs associated with returning to school. Methods to alleviate this burden will be discussed in the Synthesis of Evidence.

CONSEQUENCES

3.6
Million children
out of school

90%
Of students are
reading below
proficiency levels

9,382
Schools partially
or completely
destroyed

Due to conflict, drought, disasters, and their aftermath, children in Ethiopia will continue to face disruptions to their education for years to come. The consequences of these disruptions include difficulties accessing safe learning environments, loss of learning of foundational skills and stunted education trajectories. This has long-term implications for children's wellbeing and for Ethiopia's overall development.

Based on a 2022 UNICEF report, the number of out-of-school children in Ethiopia rose from 3.1 million to 3.6 million within six months, marking one of the worst education crises globally. As of March 2023, the Tigray Education Bureau has issued a warning, stating that over 25,000 students are in danger of dropping out of school to assist their families in securing food and water, prompted by the looming threat of starvation stemming from the ongoing drought crisis (Addis Standard 2024).

Even before crises began in Ethiopia, the education sector saw advancements in certain aspects, but struggled to sustainably enhance foundational learning outcomes. Excluding out-of-school children (OOSC), ninety percent of late primary school-aged children in Ethiopia in 2022 lacked proficiency in reading. Figure 1 illustrates the progression from 2014 to 2018, based on a previous USAID initiative, showcasing students' performance by language and their achievement levels relative to benchmarks. As seen, learning progress varied unevenly across languages over time. The significant prevalence of zero scores (indicating students unable to correctly perform even a single task) over time in certain regions suggests the need for alternative approaches to support struggling learners in foundational learning (USAID RFI, 2023).

Figure 4: Read M&E Early Grade Reading Assessment (EGRA) Score
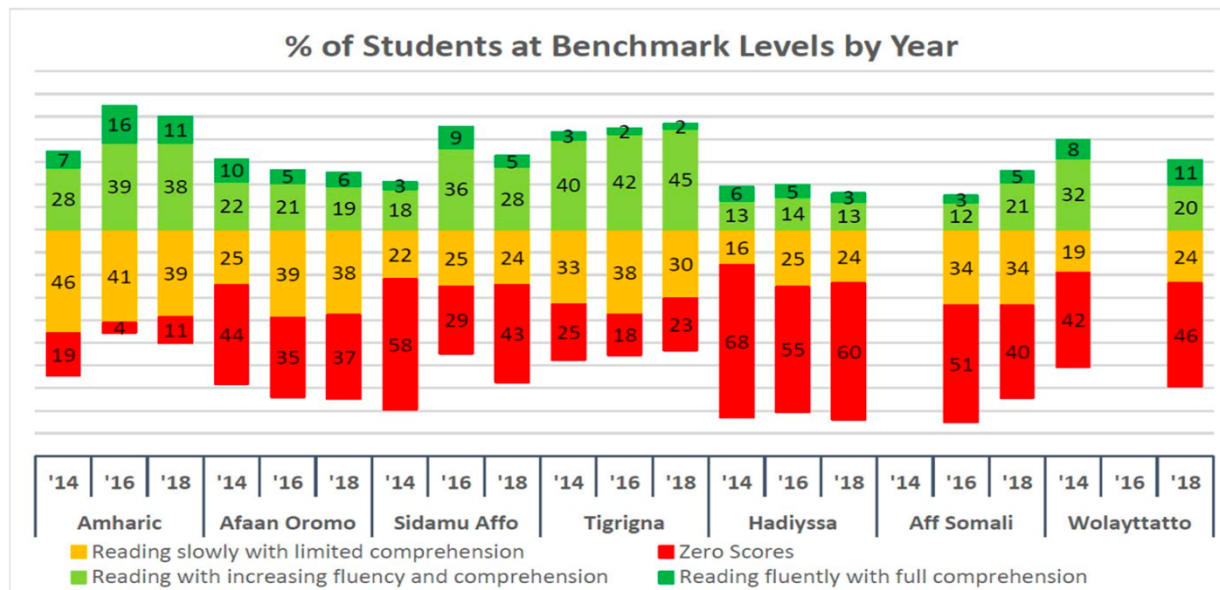
Source: USAID RFI, 2023

The impact of the war has not only affected student enrollment and outcomes but also school facilities. As a result, the United Nations estimated 9,382 schools were completely or partially destroyed as of August 2022. These conditions are even worse in the Tigray, Amhara and Afar regions with many schools needing basic provisions such as furniture to continue operations (Philipp 2023). In 2021, the Tigray education bureau conducted an initial assessment including 2,054 public primary, elementary, and secondary schools, along with two teachers' training colleges (schools in Western and parts of Northern Tigray, which were occupied by Eritrea and Amhara because of the conflict, were excluded from this assessment to evaluate damages). According to the study, 88.3% of classrooms suffered severe damage. This damage involved theft, dismantling, and burning of 96.5% of student desks, 95.9% of blackboards, 63.5% of student textbooks, along with vandalism or destruction of 85.1% of computers, 79.9% of plasma screens, 84.5% of science laboratory equipment, 92.5% of educational models, and over 48% of toilets ("TIGRAY EDUCATION BUREAU DECEMBER 2021 MEKELLE," 2021). Due to the destruction of school materials, cost estimates will include increased pricing to rebuild and resupply classrooms.

SYNTHESIS OF EVIDENCE

Understanding Gains in Education

In a sample of low- and middle-income countries, "one standard deviation gain in literacy skill is associated with between 4.7 and 6.8 additional years of schooling" (Evans and Yuan, 2019).. During a typical school year under normal conditions, students typically acquire between 0.15 and 0.21 standard deviation (SD) of literacy skills (Evans and Yuan, 2019). Meaning, if an intervention increases student test scores for the treatment group by an additional 0.15-0.21 standard deviation, that is an equivalent of an extra year of schooling compared to the control group. Jacob Cohen, an esteemed American statistician, and psychologist known for his contributions to statistical power and effect size research, outlined a fundamental approach for interpreting effect size as follows: a small effect is 0.2 SDs, a medium effect is 0.5 SDs, and a large effect is 0.8 SDs (Garski, 2017). However, these norms do not apply when analyzing international educational programs. In a Randomized Control Trial of international education studies assessing learning outcomes, Evans and Yuan observe a median effect size of 0.10 standard deviations (SDs). The 25th percentile of effect sizes stands at 0.01 SDs, the 50th percentile stands at 0.1 SDs, while the 75th percentile is at 0.23 SDs (Evans and Yuan, 2020). Any effect sizes above 0.1 SD is therefore above the median effect size observed among international education programs and can be considered sizable.

Accelerated Education Programs

Accelerated Education Programs (AEP), also known as Accelerated Learning Programs, are "flexible age-appropriate programs that promote access to education in an accelerated time frame for disadvantaged groups, over-age out-of-school children and youth who missed out or had their education interrupted due to poverty, marginalization, conflict and crisis" (Accelerated Education Programs in Crisis and Conflict: Building Evidence and Learning, 2016). The goal of AEPs is to meet students at their current educational level and provide students with an accelerated program that will cover basic education and skills. Accelerated Education Programs are designed to condense years of missed educational content to a condensed timeline (Myers and Pinnock 2017). Upon completion of an AEP, students are expected to reintegrate into formal schooling, pursue technical and vocational education focusing on skills, or directly enter the workforce ("The Case for Accelerated Education", 2020).

AEP's have been implemented in over a dozen countries, yet programs lack consistent and systematic reporting on crucial internal efficiency metrics, such as program survival rates, enrollment, and dropout rates. Despite this, there are several case studies that highlight the substantial influence of AEPs on students' literacy and numeracy skills.

Democratic Republic of the Congo

In the Democratic Republic of the Congo, girls who attended an AEP from the middle of the program to the end of the program exhibited a notable increase in scores on the EGRA by approximately 15 percentage points ($p < 0.001$) and on the EGMA by 10 percentage points ($p < 0.001$) compared to girls who stayed out of school.

Mali

In Mali, accelerated education graduates caught up and performed equally to government school enrolled children of the same grade by the end of the program. Another study in Mali found that

on literacy assessments 4.5 post transition back to grade 4 formal schooling, accelerated learning students displayed significantly superior skills compared to their counterparts in formal schools. This is despite initially having a slightly lower oral reading fluency rate than grade 3 students in government schools.

Kenya
In Kenya, AEP students scored far above the national average in national examinations conducted at the end of the program.

Afghanistan
In Afghanistan, girls in AEPs demonstrated reading fluency and numeracy scores far above their counterparts in government schools of the same grade, and they achieved significantly higher scores than their peers in government schools (Rich, 2020).

It is important to note that these studies were not conducted using causal research designs and therefore do not account for unobservable factors such as selection bias, student motivation, parental support, and more. While these studies cannot be used to determine causation, they are promising results demonstrating the correlation between AEP and student outcomes.

Ethiopia
One of the best empirically studied AEP's is in Ethiopia, called Speed School. Students from Speed Schools, aged 9-14, were paired with peers from government schools based on age and gender. Government school students were either from schools that Speed School students were expected to transition into, termed "Link Schools" for research purposes, or from government schools not receiving Speed School students. To ensure a comparable sample, students from Grades 1 to 4 were selected from both types of schools. Matching the three groups required ensuring similar characteristics among all students. The initial focus was on Speed School students, a self-selected group comprising individuals who had previously dropped out from grades 1 to 4. To ensure similarity with the comparison groups, teachers assisted in identifying students with high-risk factors such as irregular attendance or academic underperformance relative to their peers. Choosing low-risk students, such as high achievers with regular attendance, as comparison groups would have made for a poor comparison between the samples (Akyeampong et al., 2018).

Propensity score matching, a statistical technique, was used to construct an artificial control group by matching each treated unit with a non-treated unit of similar characteristics ("Propensity Score Matching", 2024). This method utilized various important variables from a 2011 household survey to compute the probability that a student enrolled in a Speed School shared similar characteristics with students from the other two groups. This probability was determined based on observed characteristics, such as household level of poverty and the number of students residing in the household. Once computed, students from Speed Schools with similar propensity scores to those from the other two schools could be matched. These matched students formed the comparison groups (Akyeampong et al., 2018).

Speed Schools used program specific exams to test student outcomes in Math, English, and Sadama. Table 2 highlights the results of Speed School students tracked to 2017.

Table 2: Percentage of Correct Answers

School type	Math	Sidama	English
Speed	47.6	46.4	42.6
Government	37.2	32.9	35.1
Link	38.5	35.7	33.5

Source: Akyeampong et al. 2018

Former Speed School students consistently outperform Government and Link School students across all three subjects (Mathematics, English, and Sidama). For instance, Speed School students scored 10.4 percentage points more in Mathematics, 13.5 percentage points in Sidama, and 7.4 percentage points in English compared to Government School students; these differences are statistically significant. On average, Speed School students outperform Government students by answering approximately 0.9 to 2.1 more questions correctly across all test items (Akyeampong et al., 2018). These results correlate to Speed School students outperforming Government students by .2115 SD in Math, .2787 SD in Sidama and .1543 SD in English (see Appendix 1 for calculations). These effects are equivalent to approximately an additional 1.6 (nearly 75th percentile), 1.75 (above 75th percentile), and .9 (above 50th percentile) years of schooling, respectively.

The better performance shown by Speed School students is also evident in figure 5 which shows learning scores in terms of terciles.

Figure 5: Terciles of Learning Score Distributions by School Type for Those Currently Attending
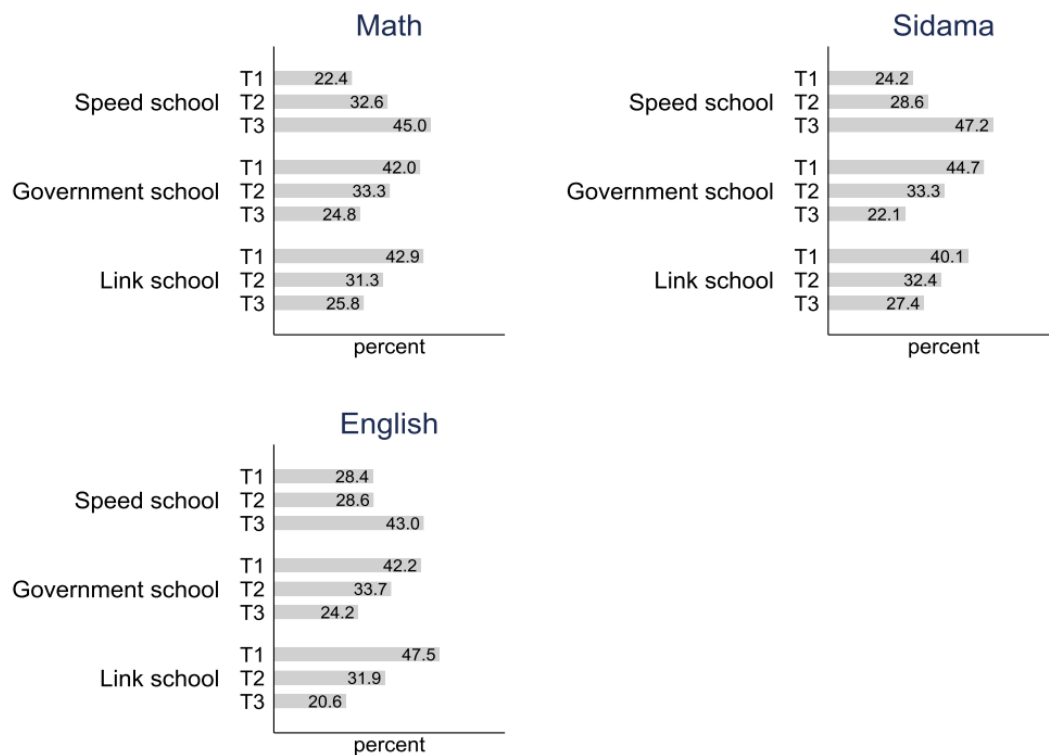
Source: Akyeampong et al. 2018

As seen, in mathematics, only 22.4% of Speed School students fall into the bottom tercile (T1), whereas the percentages for Government School and Link School students are 42% and 42.9%, respectively. Conversely, approximately 45% of Speed School students belong to the top tercile, compared to only 24.8% and 25.8% of Government and Link School students. Similar trends are observed for Sidama and English subjects (Akyeampong et al., 2018).

The favorable outcomes and feedback from the Speed School program across Ethiopia's four largest regions have prompted the Ministry to pursue full government adoption, leading to the establishment of the Speed School Unit in June 2023. The Speed School Unit is dedicated to nationwide implementation of the Speed School program, with the goal of reaching the over two million out-of-school primary-aged children in the country (Lake, 2021).

An integral component of the Speed School program involves the establishment of Mothers' Self-Help Groups. It was expected that mothers of Speed School students would join these groups, which received financial support to establish small cooperatives aimed at enhancing their business and investment skills. The overarching objective of these Self-Help Groups is to empower mothers to enroll and support their children in completing primary education. The idea is that by enhancing the business and investment abilities of mothers, household income would improve, thereby reinforcing their commitment to ensuring their children remain in school. Essentially, participation in the Self-Help Group became a prerequisite for involvement in Speed Schools. Qualitative evidence strongly indicates that mothers of Speed School students perceived the program to offer superior educational opportunities. The mother's satisfaction with their children's attendance at Speed Schools and the observed positive changes in their children's education likely bolstered their dedication to keeping them enrolled in school (Akyeampong et al., 2018).

To measure household economic status, Akyeampong et al., 2018 created an index to capture livestock and asset ownership between Speed School, Government School, and Link School households. At baseline in 2011, students enrolled in Speed Schools lived in households with the lowest livestock (on average 1.26 animals) and a lower number of assets, whereas students enrolled in Link and Government schools lived in households with more livestock (2.3 and 3.0 animals on average, respectively). The authors conducted a comparable analysis in 2017 which revealed that overall, Speed School student households had made considerable gains in their assets and livestock compared to Government or Link Schools. The authors conclude that the "combination of improved wealth and household commitment to support Speed School students may have some association with lowering dropout (Akyeampong et al., 2018). While this is not evidence of a causal relation between the Mother's Self-Help group, it provides reason to believe that improving household economic status through this program can reduce dropout rates.

> Takeaway: There is strong evidence, both causal and correlational, to suggest that Accelerated Education Programs raise student test scores and increase enrollment for OOSC.

Targeted Learning Instruction

Targeted Learning Instruction is the "alignment of specific student needs to established learning goals" where "teachers use data to identify and categorize student needs and then provide

instruction to meet those needs via adaptive content and/or methods" (SchoolWorks, 2018). Targeted learning relies on continued assessment and observation to determine baseline academic levels of students, measure student progress, and adjust program components accordingly (SchoolWorks, 2018). There are several ways to implement targeted instruction, however, few have been empirically evaluated. As such, this case study will focus on *Teaching at the Right Level (TaRL)*, a program pioneered by Pratham, an Indian education nonprofit as there has been robust empirical analysis conducted (Pratham, 2020). TaRL was designed to predominantly help children in grade 3 to 5 who have been "left behind" in the educational system quickly "catch up". The program has been implemented by community volunteers, Pratham staff, and "government frontline workers and teachers" across India (Pratham, 2020).

TaRL has evolved between 2000-2014, having been implemented approximately 6 times using different formats that vary by location, duration, and moderator. The most referenced form of TaRL is called the Balsakhi Program (implemented between 2001-2004). The program was typically implemented by a young woman of the community who has finished secondary school. The instructor typically met with 15-20 students in a class for two hours during the school day and were paid $10-15 per month (Banerjee et al. 2004). Instructors received two weeks of training at the beginning of the program in addition to reinforced training while school is in session. Instructors used a standardized curriculum provided by Pratham (Banerjee et al. 2007).

The program yielded significant positive effects on children's academic performance. In both districts where the program was implemented, the Balsakhi program led to notable improvement in overall test scores, with increases of 0.14 standard deviations (an additional .88 years of schooling) in the first year and 0.28 standard deviations (an additional 1.8 years of schooling) in the second year, particularly prominent in mathematics. Notably, the program's primary targets, the weakest students, experienced the greatest improvements (Banerjee et al. 2004). By the end of the second year, this intervention falls above the 75th percentile of effect sizes for international education programs.

While the Balskhi method is one of the most referenced targeted learning instruction programs, the intervention occurred in the cities of Mumbai and Vadodara where there was rapid turnover among the Balsakhi tutors. Tutors typically only stayed for one year (usually until they got married or got another job). Despite the frequent turnover among tutors, the program yielded substantial improvements in student learning, indicating that its success was not reliant on a few exceptionally dedicated and enthusiastic individuals (Banerjee et al., 2015). However, this rapid turnover of tutors is unlikely to be feasible in rural communities with limited resources. It is therefore crucial to thoroughly assess community capabilities before determining the appropriate type of targeted instructional program to implement.

The most effective TaRL program was called Learning Camps, conducted from 2013-2014 in the state of Uttar Pradesh. Learning camps were intensive sessions of teaching and learning, following the Pratham methodology and primarily led by Pratham volunteers and staff. These camps were held during regular school hours when standard teaching activities were temporarily suspended. During "camp" days, Pratham team members, along with trained village volunteers, organized

children in grades 3-5 based on their learning levels rather than their grades. They conducted sessions in Hindi and mathematics, each lasting about 1.5 hours (Banerjee et al. 2004).

In two regions of Uttar Pradesh, schools were randomly assigned to one of four groups, with approximately 120 schools in each:

1. 10-day camp: Schools participated in four 10-day rounds of camps, along with an additional 10-day camp during the summer.
2. 20-day camp: Schools underwent two 20-day rounds of camps, supplemented by an extra 10-day camp during the summer.
3. Materials-only: Pratham provided schools with TaRL learning materials but did not offer additional academic support.
4. Comparison group: Schools did not receive camps or materials.

The intervention significantly boosted fundamental learning outcomes, with final reading and arithmetic scores rising by up to 0.71 and 0.69 standard deviations, respectively. These results are above the 90th percentile for effect sizes and align with findings from other assessments, although the extent of improvement was notably greater. In fact, the gains in reading and arithmetic surpassed typical yearly learning advancements by more than double (Pratham, 2020). The reports do not account for why results were significantly higher for this intervention than previous iteratives. These programs were implemented using experimental methods and therefore signify a causal relation.

Figure 6: Impact of Programs Targeting Instruction to the Level of the Child

An increase of less than 0.1 standard deviations is typically considered a small effect

Note: *Tests include a mixture of math and language assessments
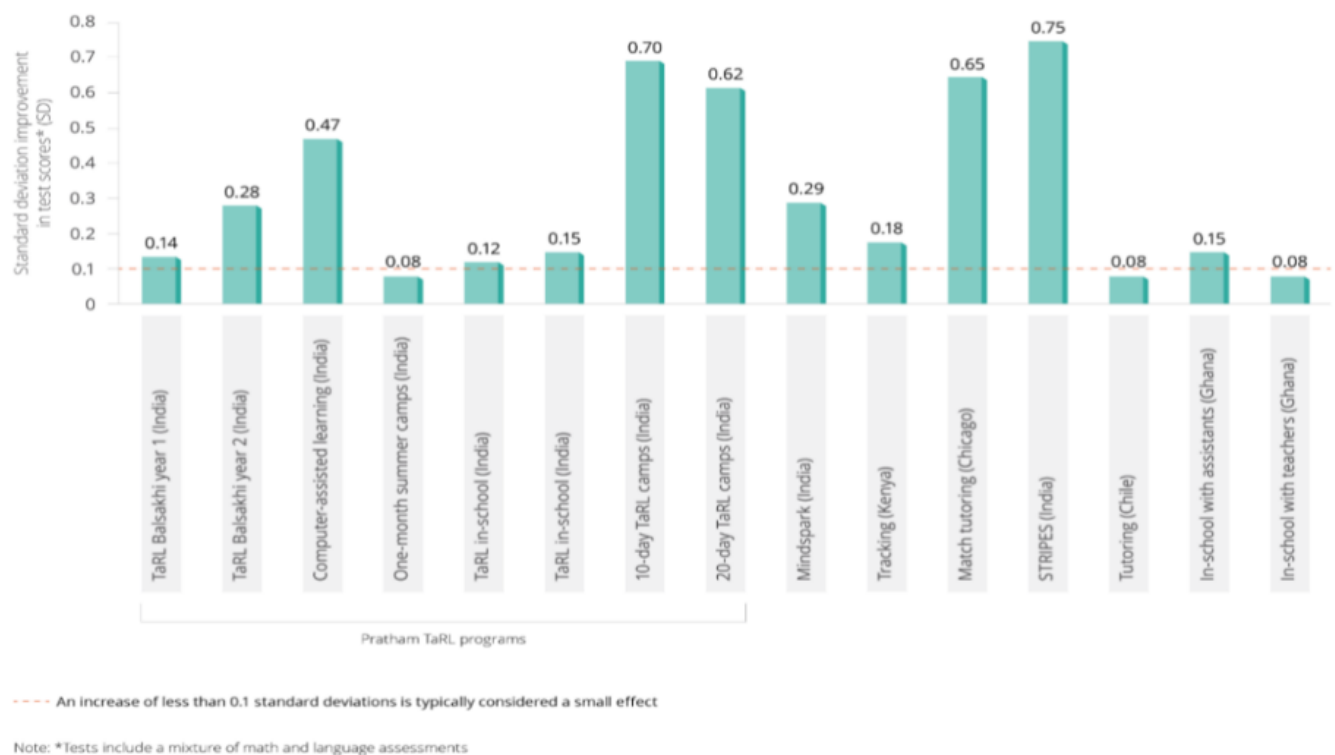
Source: Pershad et al., 2020

Figure 6 displays 15 Targeted Instruction programs and their effect sizes. An increase of less than 0.1 standard deviation is typically considered a small effect size (any programs below the red line). Figure 6 highlights the number of successful Targeted Instruction implementation.

> Takeaway: There is strong evidence that demonstrates a causal relationship between Targeted Learning Instruction and improved student outcomes.

Psychological Support to Students

Living in areas of conflict can lead to several harmful effects on adolescents such as self-harm, post-traumatic stress disorder, withdrawal from friends and family, low academic performance, and more ("5 Ways That Conflict Impacts Children's Mental Health" 2024). For students to succeed academically, it is important to provide psychological support in the wake of conflict. One notable study on the effects psychological support to students has on student outcomes was the Better Learning Program level 2 program (BLP-2), a school and classroom based, teacher-led universal psychosocial program, developed by UiT, the Arctic University of Norway and the Norwegian Refugee Council (NRC) (Norwegian Refugee Council, 2017). BLP-2 is based on universal preventive measures for traumatic stress reactions and consists of: "(1) psychoeducation and normalization of stress reactions, (2) relaxation techniques, (3) coping skills enhancement, (4) garnering social support and (5) parent involvement. In addition, BLP-2 has a goal of strengthening the following educational measures: (6) improving pedagogical study skills, (7) improving academic and general self-efficacy, and (8) modifying the teacher role by providing more appraisals and understanding of how traumatic and cumulative stress can cause academic underachievement" (Norwegian Refugee Council, 2017).

In a Randomized Control Trial, BLP-2 included the selection of 300 random students between the ages of 9 and 16 years old in Gaza from October 2018 to April 2019. Selected teachers were trained in BLP-2 to administer the intervention to a small group of 10 academic underachieving students over a period of five weeks. The intervention consists of five structured sessions of 45 minutes that are performed during the school day (Forsberg and Schultz 2022). A self-report measurement was administered to the students on three different occasions: pre BLP-2 (Test 1), post BLP-2 (Test 2), and five months post BLP-2 (Test 3). The test was developed by the authors and consisted of "17 items investigating six different domains: well-being (two items), self-regulation (three items), self-efficacy (four items), executive function/study skills (five items), future hope (one item), and self-perceived academic functioning (two items)" (Forsberg and Schultz 2022).

Grades from the BLP-2 group gathered between December 2017 and June 2018 were utilized to evaluate students for BLP-2 participation. Scores in Arabic and Math are measured from 0-100 points. During this period, the average decrease in grades for these students was 6.97 points (standard deviation: 1.552) in Arabic and 7.07 points (standard deviation: 1.589) in mathematics.

Once the program began, students in the BLP-2 group exhibited grade improvements in both Arabic, from June 2018 (mean = 61.77, SD = 19.06) to June 2019 (mean = 65.64, SD = 17.45), and mathematics (mean = 59.51, SD = 18.30 and mean = 63.02, SD = 15.17, respectively).

Conversely, the national average grades sample showed no changes in either Arabic (mean = 70.57 in June 2018, SD = 17.36 and mean = 70.20 in June 2019, SD = 18.18, respectively) or mathematics (mean = 65.00 in June 2018, SD = 17.09 and mean = 64.92 in June 2019, SD = 16.60, respectively) (Forsberg and Schultz 2022). These results are exhibited in Figures 7 and 8.

Figure 7: Academic Performance in Arabic
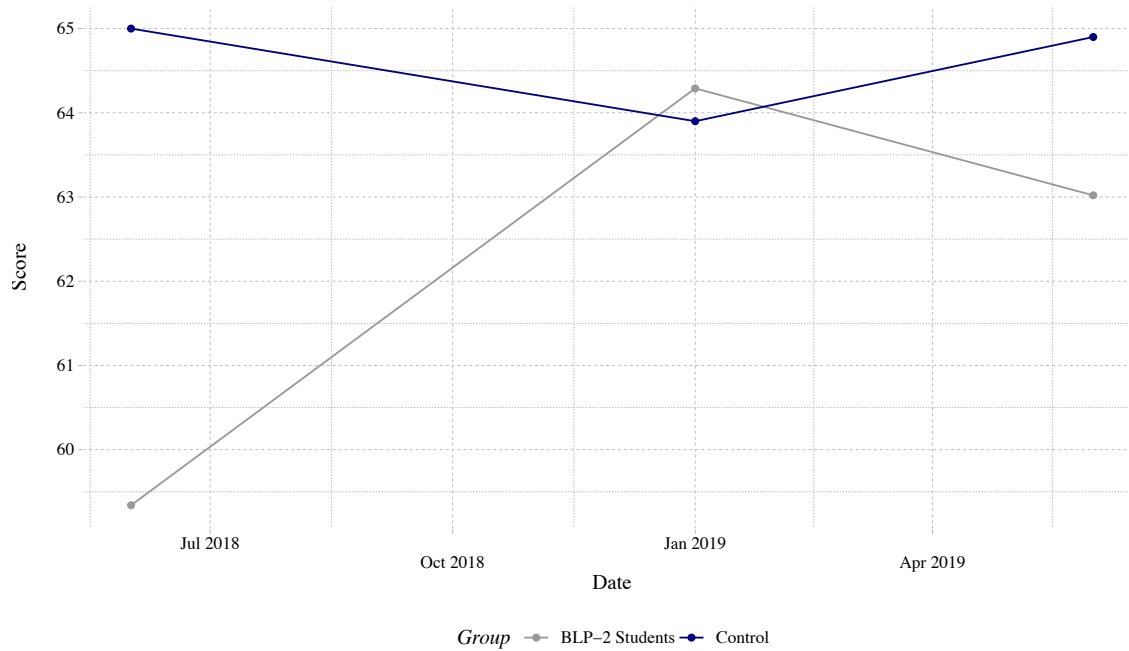
Source: (Forsberg & Schultz, 2023)

Figure 8: Academic Performance in Math
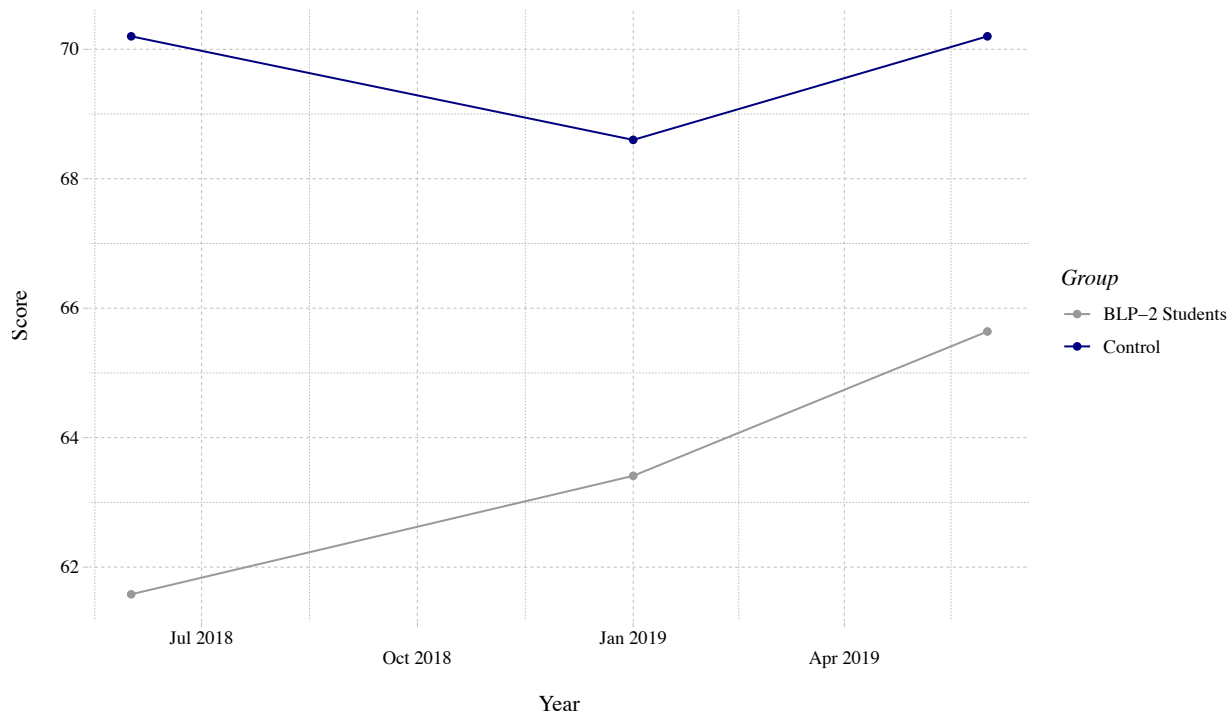
Source: (Forsberg & Schultz, 2023)

As shown, BLP-2 increases both Arabic and Math scores. Compared to the national average, BLP-2 increased student test scores in Arabic by .2457 standard deviations and .2127 standard deviations in Math (see Appendix 2 for calculations). These results fall above the 75th percentile and 50th percentile respectively, making both effects sizable.

> Takeaway: Using a RCT, there is a causal relationship between psychological support to students and student outcomes.

School Tracking

School tracking is when students are placed in groups according to their perceived ability, IQ, or achievement levels. Students are placed in high, middle, or low tracks in "an effort to provide them with a level of curriculum and instruction that is appropriate to their needs" ("Tracking and Ability Grouping in Middle Level and High Schools", 2020). Though the approaches are similar, unlike targeted learning that is intended to separate kids by level for certain periods of the day, tracking separates the entire school population into assigned classes by overall achievement. Students are grouped in academic classes only with peers who have a similar overall academic achievement level as theirs. Tracking is highly controversial with authors finding both advantages and disadvantages (Moris, 2023). In Kenya, tracked schools had higher test scores than non-tracked schools, 0.16 standard deviations for students in the bottom half and 0.19 standard deviations for students in the top half (Duflo, Dupas, and Kremer, 2011). These effects fall just below the 50th percentile. However, another study found that tracking "limits the quality of student instructional

opportunities, decreases students' perceptions of their abilities, and negatively influences student achievement" (Werblow, Urick, and Duesbery, 2013). Due to the controversial results of school tracking, it is not presented as one of the policy alternatives.

> Takeaway: Though there is evidence that school tracking improves student outcomes, it is highly controversial and can also produce negative results.

ALTERNATIVES

Alternatives will focus on the Tigray region as this region was most heavily impacted by the Tigray War. To streamline implementation, I chose to concentrate alternatives on a single region due to the linguistic diversity across regions. By selecting the Tigray region exclusively, implementers can conduct the language assessment in Tigrinya, the official language of the region. Alternatives will target children aged 9-14 years of age.

Alternative 1: Accelerated Education Program

This alternative represents an expansion of the status quo in Ethiopia. Speed Schools offer a chance for out-of-school students to re-enter public education following a ten-month period of accelerated learning instruction. Students who left government primary schools before attaining fundamental literacy and numeracy skills, along with a subset of individuals who never attended school, will be eligible to participate in a rigorous 10-month program focused on basic literacy and numeracy skills (Akyeampong et al. 2018). Given the approximately two million OOSC, it is crucial to provide interventions aimed at providing foundational skills to these children and reintegrating them into formal schooling.

Alternative 2: Targeted Learning Instruction

This alternative is based on the TaRL program in Uttar Pradesh and will be implemented by current Ethiopian teachers after receiving formal training. The teaching process begins with a basic assessment to gauge the child's current learning level and to group them according to their proficiency level rather than their grade. Subsequent assessments are used to monitor progress and make necessary adjustments to the curriculum. As children advance, they swiftly transition into more advanced groups. The teaching methodology is centered on the belief that children learn most effectively through a blend of activities conducted in large groups, small groups, and individually.

Alternative 3: Psychological Support to Students

The alternative is based on the BLP-2 program and will be administered to small groups of 10 academic underachieving students over a period of five weeks. The intervention will require NRC counselors to train Tigray MoE employees. The MoE employees will then train local teachers. MoE will visit classrooms 4x a week to ensure proper implementation with NRC counselors visiting classrooms 1x per week. The program will consist of five structured sessions of 45 minutes that are conducted during the school day (Forsberg and Schultz 2022). A self-report measurement will be administered to the students on three different occasions: at the beginning of the program, at the end of the program, and one year after the conclusion of the program.

CRITERIA

Criterion 1: Empirical Effectiveness

Empirical effectiveness assesses the expected standard deviation increase in language and math test scores associated with each alternative. Program effectiveness will be measured at three points in time: one year, two years, and five years after program completion.

Criterion 2: Cost

Costs considers the overall costs to local and federal governments in addition to initial costs of implementation. Total costs are estimated to the extent possible. Preferred alternatives minimize implementation costs as well as costs to state and local governments.

Overall cost will be measured as the total cost of developing, implementing, and maintaining each alternative. Relevant components of this total cost estimate include the number of students and teachers involved, teacher salaries, teaching materials, facilitator and training wages, travel, and building space. Costs are discounted at 2% for five years and will be evaluated on a classroom basis which will then allow implementers to determine the scale of the project (see Appendix 3 for assumptions).

Criterion 3: Cost-Effectiveness

Cost-effectiveness will measure the standard deviation increase in test scores for every $100s spent per student. Standard deviation gains per $100 spent was chosen for digestibility of information purposes. This will allow for a standard comparison across alternatives.

Criterion 4: Feasibility

At the end of the five-year program duration, the government of Ethiopia will be responsible for sustaining all programs. Feasibility will measure the existing infrastructure within Ethiopia to implement the alternative in addition to the feasibility of maintaining the program.

FINDINGS AND RECOMMENDATION

Alternative 1: Accelerated Learning Program

Empirical Effectiveness

In 2011, Speed School students outperformed Government students by .2115 SD in Math, .2787 SD in Sidama. If implemented today, we can expect a 0.1903 SD increase in Math with a range of 0.1057-0.3172 SD, and an expected increase of 0.25078 SD with a range of 0.1393-0.4180 SD in Tigrinya (See 4 for calculations). These effects are above the 50th percentile for international education outcomes and are associated approximately 0.5-2.9 years of additional schooling (Evans and Yuan, 2019).

Cost

Most classes are conducted by a para-professional facilitator possessing at least a Grade 10 certificate. The program invests in training and supporting these facilitators through a combination of practice-based workshops, dialogue-based supervision, and peer-driven reflective practices, aimed at continuously improving their effectiveness. The expected cost of establishing an accelerated classroom is $14,619 (with a range from $5,847-$17,543) (see Appendix 4 for assumptions and calculations). The cost of a Mother's Self-Help Group to support families with children returning to school is included in this cost.

Cost-Effectiveness

Tables 3 displays a cost-effective sensitivity analysis for Tigrinya. The expected cost-effectiveness is a 0.079 SD increase in Tigrinya for every $100 spent. If the program is on the low-end of effective and the most expensive, the cost-effectiveness is a 0.037 SD increase in Tigrinya for every $100 spent and if the program is on the high-end of effectiveness with the lowest cost, we can expect a 0.329 SD increase for every $100 spent (See Appendix 4 for calculations).

Table 3: Cost-Effective Sensitivity Analysis for Tigrinya

		Cost		
		$381.37	$317.80	$127.11
	0.1393	0.037	0.044	0.11
Impact	0.25078	0.066	0.079	0.197
Tigrinya	0.418	0.11	0.132	0.329

Tables 4 displays a cost-effective sensitivity analysis for Math. The expected cost-effectiveness is a 0.1903 SD increase in Math for every $100 spent. If the program is on the low-end of effective and the most expensive, the cost-effectiveness is a 0.028 SD increase in Math for every $100 spent and if the program is on the high-end of effectiveness with the lowest cost, we can expect a 0.25 SD increase for every $100 spent (See Appendix 4 for calculations).

Table 4: Cost-Effective Sensitivity Analysis for Math

		Cost		
		$381.37	$317.80	$127.11
	0.1057	0.028	0.033	0.083
Impact	0.1903	0.05	0.06	0.15
Math	0.3172	0.083	0.1	0.25

Feasibility

This alternative is highly feasible as the program is already being implemented in Ethiopia. Not only is the program being implemented by outside organizations, but also the government of Ethiopia. Government Adoption has evolved over the years. Beginning in 2017, the regional education bureaus of Oromia and Tigray opted to finance their own Speed School classes, motivated by the independently validated success of the Speed School model. In subsequent years, other program regions joined, leading to the government now funding over half of all Speed School classes. The adoption of speed schools progressed in 2021 with the establishment of an official "Speed School Unit" by the Ministry of Education. Geneva Global, the original sponsor of Speed Schools, now supports this unit along with various other key ministerial, regional, and local education entities. Notably, these include school improvement, curriculum development, teacher training, planning, and inspection, all aimed at achieving the program's full institutional integration as the cornerstone for a sustainable national expansion of Speed School in the years ahead (Global, 2021). This program is therefore highly feasible as the infrastructure for AEP already exists within the Ethiopian government and can be supported at the conclusion of USAID's project.

Alternative 2: Targeted Learning Instruction

Empirical Effectiveness

In India, the intervention significantly improved basic learning outcomes, with final reading and arithmetic scores increasing by up to 0.71 and 0.69 SDs respectively. To account for regional and country differences between India and Ethiopia, estimated scores in Ethiopia can range from a 0.35-1.065 SD increase in language (with an average expected increase of 0.636 SD) and a 0.345-1.035 SD increase in arithmetic (with an average expected SD increase of 0.621) (see Appendix 5 for calculations). Both results are above the 75th percentile for international education interventions and correspond to up to 6 years of educational schooling, making these educational gains substantial (Evans and Yuan, n.d.).

Cost

The expected cost of implementing targeted instruction is $656 per classroom (with a range from $189-$1,123) (see Appendix 5 for assumptions and calculations) (Beg et al.2019).

Cost-Effectiveness

Tables 5 displays a cost-effective sensitivity analysis for Tigrinya. The expected cost-effectiveness is a 0.674 SD increase in Tigrinya for every $100 spent. If the program is on the low-end of effective and the most expensive, the cost-effectiveness is a 0.335 SD increase in Tigrinya for every $100 spent and if the program is on the high-end of effectiveness with the lowest cost, we can expect a 1.265 SD increase for every $100 spent (See Appendix 5 for calculations).

Table 5: Cost-Effective Sensitivity Analysis for Tigrinya

		Cost		
		$104.48	$94.33	$84.17
Impact	0.35	0.335	0.371	0.416
Tigrinya	0.636	0.609	0.674	0.756
	1.065	1.019	1.129	1.265

Tables 6 displays a cost-effective sensitivity analysis for Math. The expected cost-effectiveness is a 0.658 SD increase in Math for every $100 spent. If the program is on the low-end of effective and the most expensive, the cost-effectiveness is a 0.33 SD increase in Math for every $100 spent and if the program is on the high-end of effectiveness with the lowest cost, we can expect a 1.23 SD increase for every $100 spent (See Appendix 5 for calculations).

Table 6: Cost-Effective Sensitivity Analysis for Math

		Cost		
		$104.48	$94.33	$84.17
	0.345	0.33	0.366	0.41
Impact	0.621	0.594	0.658	0.738
Math	1.035	0.991	1.097	1.23

Feasibility

The intervention in Uttar Pradesh was implemented in rural areas where there was weak educational bureaucracy. The program takes place within schools and uses current teachers as implementers, allowing for the largest number of students to be reached (Banerjee et al., 2016). Since the program is tailored to accommodate the limited resources of rural communities, the intervention is well suited to rural communities within Ethiopia. Additionally, since the intervention utilizes existing infrastructure, it will be easy for the Ethiopian government to incorporate. However, this alternative only score medium for feasibility as it is still a new program to design and implement.

Alternative 3: Psychological Support for Students

Empirical Effectiveness

Compared to the national average, BLP-2 increased student test scores in Arabic by .2457 standard deviations and .2127 standard deviations in Math (see Appendix 2 for calculations). To account for differences between Gaza and Ethiopia, estimated scores in Ethiopia can range from .1235-.368 standard deviation increase in Tigrinya (with an expected average of 0.2213 SD) and .103-.319 standard deviation increase in Math (with an expected average of 0.1894) (see Appendix 6 for assumptions and calculations). These effects are above the 50th percentile for international education outcomes and are associated approximately 0.5-2.7 years of additional schooling (Evans and Yuan, n.d.).

Cost

The expected cost of training teachers to provide psychological support to students is $2,501 per classroom (with a range from $2,518-$2,501) (see Appendix 6 for assumptions and calculations).

Cost-Effectiveness

Tables 7 displays a cost-effective sensitivity analysis for Tigrinya. The expected cost-effectiveness is a 0.379 SD increase in Tigrinya for every $100 spent. If the program is on the low-end of effective and the most expensive, the cost-effectiveness is a 0.184 SD increase in Tigrinya for every $100 spent and if the program is on the high-end of effectiveness with the lowest cost, we can expect a 0.634 SD increase for every $100 spent (See Appendix 6 for calculations).

Table 7: Cost-Effective Sensitivity Analysis for Tigrinya

		Cost		
		$67.04	$58.37	$58.09
	0.1235	0.184	0.212	0.213
Impact	0.2213	0.33	0.379	0.381
Tigrinya	0.368	0.549	0.63	0.634

Tables 8 displays a cost-effective sensitivity analysis for Math. The expected cost-effectiveness is a 0.324 SD increase in Math for every $100 spent. If the program is on the low-end of effective and the most expensive, the cost-effectiveness is a 0.154 SD increase in Tigrinya for every $100 spent and if the program is on the high-end of effectiveness with the lowest cost, we can expect a 0.549 SD increase for every $100 spent (See Appendix 6 for calculations).

Table 8: Cost-Effective Sensitivity Analysis for Math

		Cost		
		$67.04	$58.37	$58.09
	0.103	0.154	0.176	0.177
Impact	0.1894	0.283	0.324	0.326
Math	0.319	0.476	0.547	0.549

Feasibility

This alternative is the least feasible as it requires teachers to acquire a new skill set and take on the burden of providing psychological support to students. Whereas expanding the accelerated learning program builds off an existing policy in place, training teachers to address the psychological needs of students is an entirely new program. Additionally, if teachers are already tasked with getting the lowest-scoring students up to speed, it is unlikely they will have time to facilitate talks with students on well-being.

Outcomes Matrix

	Accelerated Learning Program	**Targeted Learning**	**Psychological Support**
Effectiveness	*Math*: **0.1903 SD** (0.1057-0.3172 SD) *Tigrinya*: **0.2507 SD** (0.1393-0.418 SD)	*Math*: **0.621 SD** (0.345-1.035 SD) *Tigrinya*: **0.636 SD** (0.35-1.065 SD)	*Math*: **0.1894 SD** (0.103-0.319 SD) *Tigrinya*: **0.2213 SD** (0.1235-0.368 SD)
Cost	**$14,619/class** ($5,847-$14,619/class)	**$656/class** ($189-$1,123/class)	**$2,501/class** ($2,491-$2,944/class)
Cost-Effectiveness	*Math*: **0.060 SD/$100** (0.028-0.250 SD/$100) *Tigrinya*: **0.079 SD/$100** (0.037-0.329 SD/$100)	*Math*: **0.658 SD/$100** (0.330-1.230 SD/$100) *Tigrinya*: **0.674 SD/$100** (0.335-1.265 SD/$100)	*Math*: **0.324 SD/$100** (0.154-0.549 SD/$100) *Tigrinya*: **0.379 SD/$100** (0.184-0.634 SD/$100)
Feasibility	High	Medium	Low

RECOMMENDATION

Given the analysis of policy alternatives, I recommend *expanding Accelerated Learning Programs and implementing Targeted Learning Instruction*. Alternative 3 will not be recommended as it scored the lowest in effectiveness and is the least feasible. Targeted Learning ranks the highest in three out of four criteria: demonstrating the largest gains in student test scores, the least expensive alternative, and greatest cost-effectiveness ratio while still being moderately feasible. While Accelerated Learning Programs are the most expensive alternative and therefore the least cost-effective, it is the only alternative that targets OOSC, a priority in increasing student enrollment and targeting the over three million OOSC. Expanding Accelerated Learning Programs is also the most feasible as there are already efforts being made by federal and regional governments in Ethiopia to establish more Speed Schools.

IMPLEMENTATION

Accelerated Learning

USAID should work with the Ministry of Education Speed School Unit to expand Speed Schools to the Tigray region. Under the new Speed School Unit are three full-time senior experts operating under the Alternative Education Directorate within the Ministry of Education. The Unit's primary responsibility is to provide guidance and support to other directorates and units within the Ministry, as well as to various regions across Ethiopia, in the establishment and implementation of accelerated learning classes. Specifically, USAID should collaborate with the Unit to coordinate and facilitate the expansion of high-quality Speed School classes by developing and disseminating:

1. Condensed curriculum frameworks
2. Comprehensive Speed School standards
3. Teacher training guides, materials, and holistic strategies
4. A Self-Help Group strategy
5. Dedicated monitoring and evaluation indicators and strategies
6. A model for continuous supervision and support of Speed School classes and Self-Help Groups (Lake, 2021).

Operating under the oversight and guidance of both the Steering and Technical Committees, the Unit will ensure quarterly meetings to address policy and strategic issues, validate standards and curricular directions, and foster collaboration within the Ministry, as well as with regional educational bureaus, civil society partners, and other key stakeholders.

Targeted Instruction

There are a few key implementation advantages with targeted instruction. One notable feature of this program is its scalability. With Pratham relying on locally trained personnel for short periods, the program boasts minimal costs and is easily replicable. This means that current teachers can be paid a stipend for the extra training associated with the intervention. The curriculum and teaching methods are straightforward and standardized making for easy implementation (Banerjee et al. 2007). Chemonics and USAID should work with Regional and Local education personnel to devise a Targeted Instruction training manual for teachers.

Stakeholders: Roles and Perspectives

There are several stakeholders involved in this intervention such as the students, parents of the students, community instructors, local and federal Department of Education, and Pratham trainers.

Students

Students will be required to attend the educational sessions which can either be during school hours or after school sessions. Implementers can most likely expect a mixed reception from students. It is likely that students who value their education will be excited by the prospect of focusing on basic skills, while others might not see the value in furthering their education. It will be important to highlight the positive long- term effects of education on employment. A group of enthusiastic students can also be leveraged to motivate their peers.

Parents

Like the students, there is likely to be a mixed response from parents of students. There is likely to be a positive response from several parents who want their children to be educated. There is also likely to be a subset of parents who cannot afford to have their children in school, or for longer hours, due to the need for some children to help provide for their families. To mitigate this issue, my client could hold various local meetings, emphasizing the importance of education on future outcomes. Additionally, a Self-Help Group will be available to mothers of students entering Speed Schools. Assisting with income-generating endeavors and group savings schemes, the Self-Help Groups empowers mothers to secure funds required for their children's future schooling expenses. Moreover, these groups actively engage in supporting classroom instruction and tackling external community barriers that hinder school participation and performance, particularly for girls. The effectiveness of the Speed School program has been attributed to the shared and enthusiastic dedication of students, teachers, and parents towards the learning journey.

Community Instructors/Teachers

Community instructors/teachers will be responsible for guiding the lessons and there is likely to be a mixed response. Some teachers might approve of efforts to get lowest-scoring students up to grade-level skills and be eager to participate. Others might be wary of the effectiveness of this alternative and the extra time required for lessons. To mitigate this, efforts should target community members/teachers eager to participate in the program.

Local and Federal Department of Education

It is important that this alternative be implemented with the approval and involvement of local and federal Department of Education government officials as the alternative will be implemented in municipal schools. Local education officials can help select villages/instructors to target, coordinate with local schools, and coordinate with Pratham. Ethiopia continues to invest in their education system and is therefore likely to encourage any program that targets the lowest-scoring students.

Pratham Facilitators

Pratham facilitators will be responsible for flying to Ethiopia, the initial training of local instructors, and providing follow up instruction throughout the school year. As Pratham is an organization designed to implement targeted-based learning, with experience in African countries, there is likely to be a positive response in creating a program in Ethiopia.

Challenges and "worst case scenario"

Getting students back to school

As a result of the conflict in northern Ethiopia, the education system in Tigray was non-operational during the 2020/21 academic year. This situation made it impossible for the 1.3 million students who were enrolled in primary, middle, and secondary education during the 2019/20 academic year to resume their schooling ("Education Investments in Challenging Times 2021/22 ETHIOPIA," n.d.). As some students have been out of school for 1-3 years, it may be difficult to bring students back to school. The Mother's Self-Help Group will provide a support system for families to encourage children returning to school.

Worst case scenario

One of the worst-case scenarios is if the training facilitators are unable to access the regions with the lowest scoring students. This could happen if the conflict and fighting resumes. Should this happen, there are very few options for proceeding with the alternative as it is incredibly difficult to deliver materials to active-combat zones. However, this possibility is unlikely.

School locations

As the conflict in Tigray extended into the Afar and Amhara regions, a total of 1,090 schools were completely destroyed, 3,220 schools suffered partial damage, and approximately 1.9 million children were deprived of their education in these two regions ("Education Investments in Challenging Times 2021/22 ETHIOPIA," n.d.). To combat these issues, Temporary Learning Spaces can be utilized to create temporary spaces while schools are being rebuilt.

CONCLUSION

As a result of previous and ongoing conflict, environmental challenges, displacement, and more, the Ethiopian education sector is in crisis. With millions of students out of school and ninety percent of in-school students reading below grade proficiency, it is more essential than ever to return children to school and improve foundational skills. For many children in Ethiopia, Accelerated Education Programs are the only pathway to raising their foundational skill sets and reintegrating into the formal school system. Expanding AEPs will help reach these OOSC students. Not only is it essential to return students to school, but to raise foundational skills for all levels. Targeted Learning Instruction can help ensure that all students in school are meeting proficiency levels.

Appendices

Appendix 1: Standard Deviation Calculation (Accelerated Education Program)

To calculate the standard deviation change in outcomes, I used the equation for pooled standard deviation, as (for two independent samples) (Lipsey et al., n.d.). This effect size is defined as the difference between the mean of the intervention group and the mean of the control group on a given outcome measure divided by the pooled standard deviations for those two groups, as follows:

$$ES = \frac{\overline{X}_T - \overline{X}_C}{s_p}$$

The pooled standard deviation is obtained as the square root of the weighted mean of the two variances, defined as:

$$s = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

Where to

Calculate the pooled standard deviation
sqrt(((treatment n-1)*(treatment pct correct*(1-treatment pct correct))   +   (control n-1)*(control_pct_correct*(1-control_pct_correct)))/(treatment_n+control_n-2))

Calculate Cohen's d (i.e., standardized effect size)
(treatment_pct_correct-control_pct_correct)/pooled_sd

Math
Step 1: (625-1)(.476)(.524) + (625-1)(.372)(.628) (625+625) -2= .4916
Step 2: (.476-.372) .4916 = **.2115 SD**

Sidama
Step 1: (625-1)(.464)(.536) + (625-1)(.329)(.671) (625+625) -2= . 4844
Step 2: (.464-.329) .4844 = **.2787 SD**

English
Step 1: (625-1)(.426)(..574) + (625-1)(.351)(.649) (625+625) -2= .4859
Step 2: (.426-.351) .4859 = **.1543 SD**

Appendix 2: Standard Deviation Calculations (Psychological Support)

Calculation:
1. Treatment_Score - Control_Score SD for baseline
2. Treatment_Score - Control_Score SD for endline
3. SD change for baseline - SD change endline

Arabic		
61.58 - 70.2= -8.62	SD= 17.36	-8.62 17.36= -0.4965
65.64 - 70.2= -4.56	SD= 18.16	-4.56 18.16= -0.2508
		-0.2508 - -0.4965= **.2457 SD**

Math		
59.34 - 65= -5.66	SD= 17.36	-5.66 17.36= -0.3260
63.02 - 64.9= -1.88	SD= 16.6	-1.88 16.6= -0.1132
		-0.3260 - -0.1132= **.2127 SD**

Appendix 3: Cost Assumptions

Cost Assumptions	
Discount Rate	Discount rate used by the Federal government ("Circular No. A-4: Regulatory Analysis," 2023)
Marginal Costs of Government Funds	Marginal cost to government funds "measures the loss incurred by society in raising additional revenues to finance government spending due to the distortion of resource allocation caused by taxation" (Browning, 2024).
Educational Counselor and Career Advisor Hourly Wage	Hourly wage for a United States counselor and career. Salary used to estimate the cost of teacher training (Occupational Employment and Wage Statistics, 2022).
Assumed Fringe Benefits	Assumed fringe benefits, the additional cost for employee benefits is 130%, ⅓ of employee salary (Bureau of Labor Statistics, 2016).

Appendix 4: Alternative 1 Assumptions and Calculations

See spreadsheet for additional Cost Calculations
See spreadsheet for additional Cost-Effective Calculations

Criterion	Assumptions and Calculations
Effectiveness	To capture the possibility that the program is less effective than when previously implemented due to new violent conflict and environmental challenges, I multiplied the previous estimates by 0.5 to capture the low end of expected outcomes (meaning the program is 50% less effective as in the past). To capture the possibility that the program is more effective than when previously implemented and exceeds expectations, I multiplied the previous estimates by 1.5 to capture the high end of expected outcomes (meaning the program is 50% more effective than in the past). *Math*: 0.2115*0.5 - 0.2115*1.5= range of **0.1057-0.3172 SD** *Tigrinya*: 0.2787*0.5 - 0.2787*1.5= range of **0.1393-0.4180 SD** *English*: 0.1543*0. 5- 0.1543*1.5= range of **0.0771-0.2314 SD**
Cost	The initial setup cost for establishing a Second Chance classroom in Ethiopia was estimated to be around $6,000 in 2011 (Fund 2019). This would be approximately $7,200 in 2024. Costs for Mother Self-Help Group are lumped into the classroom costs. *Best Case Classroom Cost:* To capture the possibility that the program is less expensive than when previously implemented, I multiplied the previous estimates by 0.5 to capture the low end of expected costs. *Worst Case Classroom Cost:* To capture the possibility that the program is more expensive than when previously implemented, I multiplied the previous estimates by 1.5 to capture the low end of expected costs. *Best/Worst Case Probability:* Due to past and continuous violence and environmental challenges occurring in Ethiopia, I estimate that there is a 75% chance of the worst-case costs and a 25% of best-case costs. *Expected Cost and Range:* Expected costs and cost range are calculated based on assumptions made and simulations. See spreadsheet for additional Cost Calculations

Cost-Effectiveness	See spreadsheet for [Cost-Effective Calculations](#)
Feasibility	High

Appendix 5: Alternative 2 Assumptions and Calculations

See spreadsheet for additional Cost Calculations
See spreadsheet for additional Cost-Effective Calculations

Criterion	Assumptions and Calculations
Effectiveness	To capture the possibility that the program is less effective than when implemented in India, I multiplied the previous estimates by 0.5 to capture the low end of expected outcomes (meaning the program is 50% less effective as in the past). To capture the possibility that the program is more effective than when implemented in India, I multiplied the previous estimates by 1.5 to capture the high end of expected outcomes (meaning the program is 50% more effective than in the past). *Math*: 0.69*0.5 - 0.69*1.5= range of **0.345-1.035 SD** *Tigrinya*: 0.71*0.5 - 0.71*1.5= range of **0.35-1.065 SD**
Cost	The initial setup cost for establishing targeted instruction in India ranges from $2-$10 per student (Banerjee et al., 2007). *Number of Students in Classroom* I estimate an average of 46 students per classroom ("Education Factsheet: Ethiopia," 2022) *Best Case Classroom Cost:* To capture the possibility that the program is less expensive than when previously implemented, I multiplied the previous estimates by 0.5 to capture the low end of expected costs. I then multiplied the per student cost by the number of students in the classroom to get a cost of $189. *Worst Case Classroom Cost:* To capture the possibility that the program is more expensive than when previously implemented, I multiplied the previous estimates by 1.5 to capture the low end of expected costs. I then multiplied the per student cost by the number of students in the classroom to get a cost of $1,123. *Best/Worst Case Probability:* Due to past and continuous violence and environmental challenges occurring in Ethiopia, I estimate that there is a 75% chance of the worst-case costs and a 25% of best-case costs. *Teacher Grant for New Skills* I estimate the additional payment for teachers because of increased training as $0.4 (a 5% increase in wages) ("Teacher Certification Raises Salaries but Not

	Quality," 2024; ("Teach in Ethiopia - Teaching Jobs in Ethiopia | Teach Away," 2022).
	Expected Cost and Range: Expected costs and cost range are calculated based on assumptions made and simulations run.
	See spreadsheet for additional Cost Calculations
Cost-Effectiveness	See spreadsheet for additional Cost-Effective Calculations.
Feasibility	High

Appendix 6: Alternative 3 Assumptions and Calculations

See spreadsheet for additional Cost Calculations
See spreadsheet for additional Cost-Effective Calculations

Criterion	Assumptions and Calculations
Effectiveness	To capture the possibility that the program is less effective than when implemented in Gaza due to regional and country differences, I multiplied the previous estimates by 0.5 to capture the low end of expected outcomes (meaning the program is 50% less effective as in the past). To capture the possibility that the program is more effective than when implemented in Gaza, I multiplied the previous estimates by 1.5 to capture the high end of expected outcomes (meaning the program is 50% more effective than in the past). *Math*: 0.2127*0.5 - 0.2127*1.5= range of **0.103-0.319 SD** *Tigrinya*: 0.2457*0.5 -0.2457*1.5= range of **0.1235-0.368 SD**
Cost	Number of employees days is based on the BLP-2 project (Forsberg and Schultz, 2022). *Number of Employees* NRC: 2 employees MoE: 10 Employees Teachers: 20 employees *Number of Training Days* NRC: 3 days MoE: 5 days Teachers: 2 days *Daily Daily Salary* NRC: $385 (Cherry, 2015) MoE: $8 ("Ministry of Education Ethiopia", 2021) Teachers: $5.87 ("Average Secondary School Teacher Salary in Ethiopia for 2024," 2024) *Number of NRC employees stationed in Ethiopia:* 2 employees *Cost of Living/month:* $75/month (Livingcost, 2020) *Number of Months:* 5 months (duration of program)

	Costs of Flights: $1,200 ("Trip from Oslo to Ethiopia," 2021) *Number of Fights:* 2 flights *Teacher Grant for New Skills:* I estimate the additional payment for teachers as a result of increased training as $0.4 (a 5% increase in wages) ("Teacher Certification Raises Salaries but Not Quality," 2024; ("Teach in Ethiopia - Teaching Jobs in Ethiopia | Teach Away," 2022). *Expected Cost and Range:* Expected costs and cost range are calculated based on assumptions made and simulations run. See spreadsheet for Cost Calculations
Cost-Effectiveness	See spreadsheet for Cost-Effective Calculations
Feasibility	Low

REFERENCES

"5 Ways That Conflict Impacts Children's Mental Health." 2024. Save the Children. 2024. https://www.savethechildren.org/us/what-we-do/protection/mental-health/ways-conflict-impacts-childrens-mental-health .

Accelerated Education Programs in Crisis and Conflict: Building Evidence and Learning. (2016). https://inee.org/sites/default/files/resources/AEP%20-%20Brief.pdf

Akyeampong, Kwame; Delprato, Marcos; Sabates, Ricardo; James, Zoe; Pryor, John; Westbrook, Jo; et al. (2018). Speed School Programme in Ethiopia. Tracking the progress of Speed School students 2011-2017. University of Sussex. Report. https://hdl.handle.net/10779/uos.23462414.v1

Average Secondary School Teacher Salary in Ethiopia for 2024. (2024). Retrieved April 4, 2024, from World Salaries website: https://worldsalaries.com/average-secondary-school-teacher-salary-in-ethiopia/

Banerjee, Abhijit Banerjee, Shawn Cole, Esther Duflo, and Leigh Linden. 2004. "Balsakhi Remedial Tutoring in Vadodara and Mumbai, India." Pratham. 2004. https://prathamusa.org/website-admin/wp-content/uploads/2017/04/JPAL.pdf.

Banerjee, Abhijit , Shawn Cole Cole, Esther Duflo, and Leigh Linden. 2015. "Balsakhi Remedial Tutoring in Vadodara and Mumbai, India | the Abdul Latif Jameel Poverty Action Lab." The Abdul Latif Jameel Poverty Action Lab (J-PAL). 2015. https://www.povertyactionlab.org/evaluation/balsakhi-remedial-tutoring-vadodara-and-mumbai-india.

Banerjee, Abhijit V., Rukmini Banerji, James Berry, Harini Kannan, Shobhini Mukerji, and Michael Walton. 2016. "Mainstreaming an Effective Intervention: Evidence from Randomized Evaluations of 'Teaching at the Right Level' in India." *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2846971.

Beg, Sabrin, Anne Fitzpatrick, Adrienne Lucas, Edward Tsinigo, and Henry Atimone. 2019. "Milestone 4: Impact Analysis Report Prepared for the World Bank Group, the Strategic Impact Evaluation Fund -Contract No.: 7180606." https://documents1.worldbank.org/curated/en/184851585721598666/pdf/Strengthening-Teacher-Accountability-to-Reach-All-Students-STARS-Milestone-4-Impact-Analysis-Report.pdf.

Bollemeijer, Iris. 2022. "Addressing Drought and Hunger in Somalia and Ethiopia." International Medical Corps. August 4, 2022. https://internationalmedicalcorps.org/story/drought-in-somalia-and-ethiopia/?gad_source=1&gclid=Cj0KCQjw8J6wBhDXARIsAPo7QA8tVDdBJb2HCEQwB2n-TSvdXAjTNvPPeXTcjHY13Q9ZUFJvJDDUvZYaAlBcEALw_wcB.

Browning, E. K. (2024). The Marginal Cost of Public Funds on JSTOR. Retrieved April 5, 2024, from Jstor.org website: https://www.jstor.org/stable/1831901

Bureau of Labor Statistics. (2016). *EMPLOYER COSTS FOR EMPLOYEE COMPENSATION – SEPTEMBER 2016*. Retrieved from https://www.bls.gov/news.release/pdf/ecec.pdf

Center for Preventive Action. 2023. "Conflict in Ethiopia | Global Conflict Tracker." Council on Foreign Relations. December 19, 2023. https://www.cfr.org/global-conflict-tracker/conflict/conflict-ethiopia.

Cherry, K. (2015). The 9 Highest Paying Psychology Careers. Retrieved April 4, 2024, from Verywell Mind website: https://www.verywellmind.com/the-9-highest-paying-psychology-careers-2794940

"Circular No. A-4: Regulatory Analysis." 2023. The White House. November 9, 2023. https://www.whitehouse.gov/wp-content/uploads/2023/11/CircularA-4.pdf.

Duflo, Esther, Pascaline Dupas, and Michael Kremer. 2011. "Peer Effects, Teacher Incentives, and the Impact of Tracking: Evidence from a Randomized Evaluation in Kenya." *The American Economic Review* 101 (5): 1739–74. https://www.jstor.org/stable/pdf/23045621.pdf?refreqid=fastly-default%3A218dd7913a04af7018a809233ef464cf&ab_segments=&origin=&initiator=&acceptTC=1.

"Education Factsheet: Ethiopia." 2022. United Nations Refugee Agency. United Nations High Commissioner for Refugees. 2022. file:///Users/sarahboches/Downloads/Education%20Factsheet,%20UNHCR%20Ethiopia%2020221206.pdf.

"Ethiopia: Drought - 2015-2024." 2023. ReliefWeb. February 28, 2023. https://reliefweb.int/disaster/dr-2015-000109-eth.

Evans, David, and Fei Yuan. 2019. "Equivalent Years of Schooling a Metric to Communicate Learning Gains in Concrete Terms." *World Bank Group*. https://documents1.worldbank.org/curated/en/123371550594320297/pdf/WPS8752.pdf.

Evans, David , and Fei Yuan. 2020. "How Big Are the Impacts of International Education Interventions?" Center for Global Development. 2020. https://www.cgdev.org/blog/how-big-are-impacts-international-education-interventions.

Garski, Linda. 2017. "John Hattie Effect Size in Education | Renaissance." Renaissance. June 15, 2017. https://www.renaissance.com/2017/06/15/blog-the-john-hattie-effect-size-in-educational-research-what-is-it-and-how-is-it-used/#:~:text=Many%20people%20consider%20John%20Hattie,to%20indicate%20highly%20effective%20treatments.

"Increasing Number of Children Pushed out of Education in Ethiopia due to Severe Drought, Conflict and Forced Displacement - Ethiopia." 2022. ReliefWeb. December 7, 2022. https://reliefweb.int/report/ethiopia/increasing-number-children-pushed-out-education-ethiopia-due-severe-drought-conflict-and-forced-displacement.

Lake, Sierra. 2021. "Ethiopia Inaugurates New Speed School Unit to Reach Out-of-School Children - Geneva Global." Geneva Global. August 25, 2021. https://genevaglobal.com/blog/ethiopia-inaugurates-new-speed-school-unit-to-reach-out-of-school-children/.

Lipsey, Mark, Kelly Puzio, Cathy Yun, Michael Hebert, Kasia Steinka-Fry, Mikel Cole, Megan Roberts, Karen Anthony, and Matthew Busick. n.d. "NCSER 2013-3000 Translating the Statistical Representation of the Effects of Education Interventions into More Readily Interpretable Forms NOVEMBER 2012." https://ies.ed.gov/ncser/pubs/20133000/pdf/20133000.pdf.

Livingcost. (2020, July 27). Cost of Living in Ethiopia: prices in 10 cities compared. Retrieved April 4, 2024, from Livingcost website: https://livingcost.org/cost/ethiopia

"Ministry of Education Ethiopia." 2021. Ministry of Education Ethiopia Reporter Salaries in Addis Ababa, Ethiopia. Glassdoor. 2021. https://www.glassdoor.com/Salary/Ministry-of-Education-Ethiopia-Reporter-Salaries-EJI_IE2942141.0,30_KO31,39_IM1391.htm

Moris, Terrin. 2023. "The Effect of School Tracking on Student Achievement and Inequality: A Meta-Analysis - Éder Terrin, Moris Triventi, 2023." Review of Educational Research. 2023. https://journals.sagepub.com/doi/full/10.3102/00346543221100850.

Norwegian Refugee Council. (2017). Better Learning Program 2: Group sessions. Improving study skills, education in emergencies. Department of Education, University of Tromsø, The Arctic University of Norway, & Norwegian Refugee Council.

Occupational Employment and Wage Statistics. (2022, March 31). Retrieved April 5, 2024, from U.S Bureau of Labor Statistic website: https://www.bls.gov/oes/current/oes_47900.htm#21-0000

Pershad, D., Comba, R., & Bergmann, J. (2020). From schooling to learning for all: Reorienting curriculum and targeting instruction. Background paper prepared for the Save Our Future white paper Averting an Education Catastrophe for the World's Children. Save Our Future. https://saveourfuture.world/white-paper/

Philipp, Jennifer. 2023. "The Biggest Education Crisis in Ethiopia - the Borgen Project." The Borgen Project. June 23, 2023. https://borgenproject.org/the-biggest-education-crisis-in-ethiopia/.

Pratham. (2020). Teaching at the Right Level : From concern with exclusion to challenges of implementation. Background paper prepared for UNESCO 2020 GEM Report. https://unesdoc.unesco.org/ark:/48223/pf0000373668

"Propensity Score Matching - Dimewiki." 2024. Worldbank.org. 2024. https://dimewiki.worldbank.org/Propensity_Score_Matching#:~:text=Propensity%20score%20matching%20(PSM)%20is,the%20impact%20of%20an%20intervention..

Reuters. 2024. "Ethiopia Extends State of Emergency in Amhara." Reuters. February 2, 2024. https://www.reuters.com/world/africa/ethiopia-extends-state-emergency-amhara-2024-02-02/.

Rich, Sebastian . 2020. "Accelerated Education Evidence Review ." https://inee.org/sites/default/files/resources/AEWG_Accelerated%20Education%20Evidence%20Review.pdf.

"School Entrance Age: Duration and Official Ages for School Cycle." 2018. The World Bank. *2018*. https://www.epdc.org/sites/default/files/documents/EPDC_NEP_2018_Ethiopia.pdf.

"Teach in Ethiopia - Teaching Jobs in Ethiopia | Teach Away." (2022, September 9). Retrieved April 4, 2024, from Teach Away website: https://www.teachaway.com/teach-ethiopia

Teacher Certification Raises Salaries but not Quality. (2024). Retrieved April 4, 2024, from NBER website: https://www.nber.org/digest/aug03/teacher-certification-raises-salaries-not-quality

"The Case for Accelerated Education." 2020. *Accelerated Education Working Group (AEWG)*. https://inee.org/sites/default/files/resources/AEWG-Accelerated_Education_Brief-screen.pdf.

"TIGRAY EDUCATION BUREAU DECEMBER 2021 MEKELLE." 2021. https://www.tghat.com/wp-content/uploads/2022/05/damage-report-English1.pdf.

"Tracking and Ability Grouping in Middle Level and High Schools." 2020. NASSP. June 4, 2020. https://www.nassp.org/tracking-and-ability-grouping-in-middle-level-and-high-schools/.

Trip from Oslo to Ethiopia. (2021). Retrieved April 4, 2024, from Google Flights website: https://www.google.com/travel/explore?sca_esv=4de3fa5a8bc7be4e&sca_upv=1&sxsrf=ACQVn0949jvxttpoLScEDJK1pDsevyp-2Q:1712252026506&source=flun&uitype=cuRR&hl=en&gl=us&curr=USD&tfs=CAEQAxopEgoyMDI0LTA0LTIwagwIAhIIL20vMDVsNjRyDQgEEgkvbS8wMTlwY3MaKRIKMjAyNC0wNC0yNGoNCAQSCS9tLzAxOXBjc3IMCAISCC9tLzA1bDY0emhDalJJVUhCb2VsWkJRRVZuUFFZFZWQlJVVXRTTEVZDUnkwdExTMHRMRUzB0TFhWcWJXOHhNa2o0ZCUVVGQlIxbbFBBBgBIAE&ved=1t:27243&ictx=111

USAID RFI.pdf. (2023). Retrieved April 5, 2024, from Govtribe.com website: https://govtribe.com/file/government-file/72066324rfi00001-72066324rfi00001-new-primary-education-activity-dot-pdf

Werblow, Jacob, Angela Urick, and Luke Duesbery. 2013. "On the Wrong Track: How Tracking Is Associated with Dropping out of High School." Equity & Excellence in Education. ResearchGate. April 2013. file:///Users/sarahboches/Downloads/TrackedPublished.pdf

"What Is Theory of Change?" 2024. Aifs.gov.au. 2024. https://aifs.gov.au/resources/practice-guides/what-theory-

change#:~:text=A%20theory%20of%20change%20is%20a%20diagram%20or%20written%20description,will%20lead%20to%20particular%20outcomes..