OPPORTUNITY EDUFINANCE
IMPACT ON LEARNING OUTCOMES
Endline Findings | **Kenya**

OPPORTUNITY EduFinance

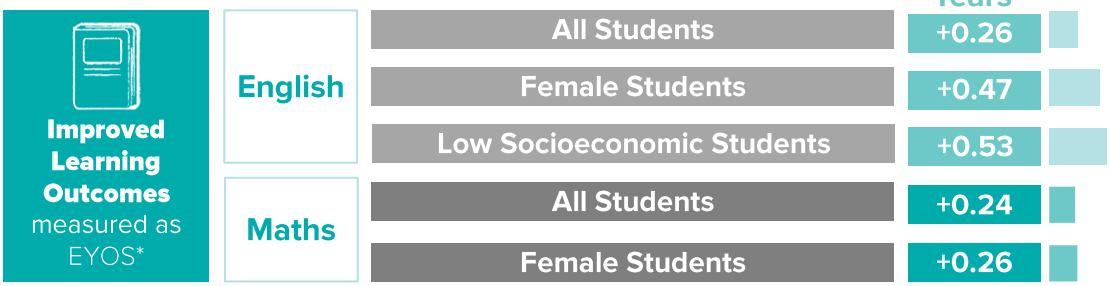
RADICAL INNOVATION FOR SOCIAL CHANGE The University of Chicago

ziziAfrique create | learn | grow

Three-year quasi-experimental study finds **children** gain as much as **half a year equivalent of additional schooling** linked to leader and teacher professional development and school improvement loans at their schools.

Key Insights: Improved Learning Outcomes

- In **English Literacy**, the study finds that students coming from **lower socioeconomic backgrounds** stand to gain the most from the Education Quality intervention – gaining the equivalent of **0.53 years of school** more than their peers throughout the study period.
- This outcome is followed closely by **girls**, who gain **0.47 years** of English literacy schooling and **all students** gain **0.26 years** from the Education Quality intervention.
- **Students** attending schools that received a loan **gained 0.24 years** in **Mathematics**, with **girls** benefitting marginally more, gaining **0.26 years.**



* EYOS = Equivalent Years of Schooling

The Quasi-Experiment: To assess learning improvements throughout **Opportunity International EduFinance's** three-year program with affordable non-state schools, EduFinance collected a baseline dataset using the **Uwezo learning assessment** in early 2021 from a sample of 131 schools that had recently joined the Education Quality program. The exercise included students from a further 70 control schools.

- **2021:** This **baseline** found that just 50% of Grade 2 students could read a story in English at Grade 2 level, 49.5% could read a story in Kiswahili, and 41.9% could do basic division.
- **2023:** The schools continued to participate in the Education Quality program through 2023 and as schools were completing the program, **EduFinance**, together with external data collector **ziziAfrique**, conducted the **endline data** collection exercise to conclude the longitudinal quasi-experimental study. The endline included 4,173 students of similar grade levels.

Design/ Analysis: EduFinance received advice on study design from the group **Radical Innovation for Social Change (RISC)** at the University of Chicago in 2021. Following the endline data collection, EduFinance and RISC analysed the data. Despite mathematically positive results across almost all assessed variables, the most statistically significant results include the above five variables.

KEY OUTPUTS

Regression outputs: The results in the table below show regressions testing the impact of:

1. The Education Quality intervention vs. Control Group
2. Receiving a school improvement loan (SIL)

Each coefficient expresses the percentage point change in pass rates from Baseline to Endline. The Equivalent Years of Schooling (EYOS) are then calculated. Finally, P-Values are used to assess the level of significance:

- the **green** shading for P-values below 0.05 (95% confidence)
- a **yellow** shade for P-values higher than 0.05 but below 0.10 (90% confidence)
- P-values higher than 0.1 have **no shading** as they show no significant impact

What are Equivalent Years of Schooling (EYOS)?

To calculate EYOS, the coefficients (expressed as percentage point change) are converted into standard deviations, and divided by the average standard deviation gained per year of schooling. For example, if an intervention improved math scores by 0.25 standard deviations and students typically learn 0.5 standard deviations per year, the EYOS is 0.5 (0.25/0.5 = 0.5).

How did we determine "Low Socioeconomic Group" students?

EduFinance, RISC and ZiziAfrique collaborated to create an index for socio-economic groups in 2020 during the study design process. Questions had to be asked of **8-year-old students** that would enable the study to differentiate by economic status.

- **These questions included:** How many people are in your house? How many rooms are in your house? What are the walls made up of? Which household items (of a list) are in your house?

The results were then stratified to enable analysis of each group.

		Education Quality vs. Control					EduFinance Loan vs. No Loan				
		Coefficient	Standard Deviation	Equivalent Years of Schooling (EYOS)	P Value		Coefficient	Standard Deviation	Equivalent Years of Schooling (EYOS)	P Value	
All Students	English	6.6	0.36	0.26	5.30%	**	-4.6	-0.24	-0.17	15.90%	*
	Maths	5.3	0.35	0.17	10.60%	*	7.2	0.45	0.24	2.00%	***
	Kiswahili	-1.2	-0.07	-0.05	75.30%		-2.0	-0.11	-0.08	57.60%	
Female Students	English	12.7	0.53	0.47	0.50%	***	-6.1	-0.25	-0.21	15.40%	*
	Maths	5.5	0.27	0.18	16.30%	*	7.7	0.36	0.26	4.00%	***
	Kiswahili	0.8	0.04	0.03	86.30%		-2.8	-0.12	-0.10	53.50%	
Low Socio Economic Group	English	12.9	0.51	0.53	1.40%	***	-5.9	-0.25	-0.24	27.20%	
	Maths	3.5	0.16	0.12	71.60%		-4.4	-0.20	-0.16	38.50%	
	Kiswahili	2.9	0.13	0.13	58.80%		-6.0	-0.27	-0.26	28.10%	

LEARNING OUTCOMES TESTING

What is Uwezo?

Pratham developed the **Annual State of Education Report (ASER)** in 2005. The report provides estimates of basic reading and arithmetic all rural districts in India and is led by citizens. The series of reports has provided a significant time series of key indicators of quality of education, and has since been **adopted in at least 14 countries** across three continents.

ASER was first adapted in 2009 as **Uwezo** ("Capability" in Kiswahili) for East Africa through Twaweza ("we can make it happen") for citizens in **Kenya**, **Tanzania**, **Uganda**. The assessment takes approximately **20 minutes per child**, assessing the following:

Literacy (in English)
- Highest level of reading: Non-reader, Letter, Word, Paragraph, Story
- 2 comprehension questions for those who can read a story

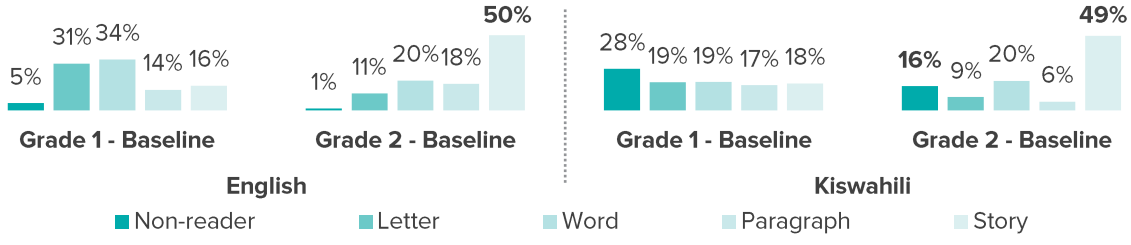
Literacy (in local language – Kiswahili)
- Highest level of reading: Non-reader, Letter, Word, Paragraph, Story
- 2 comprehension questions for those who can read a story

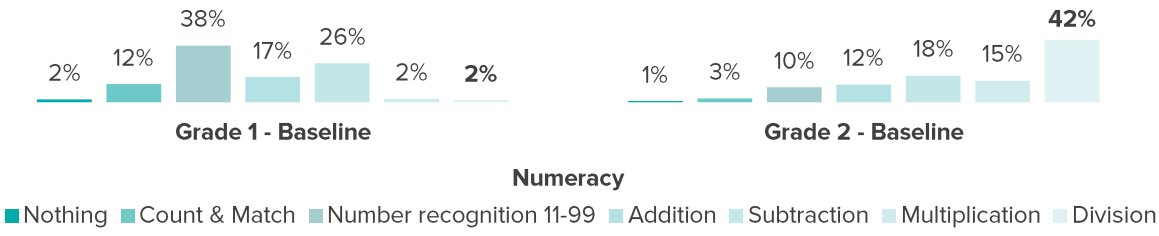
Numeracy
- Highest level of numeracy: Nothing, Count & Match, Number Recognition 11-99, Addition, Subtraction, Multiplication, Division
- 2 'ethno-maths' questions requiring addition or subtraction in a familiar cultural context

What level of learning were students at during baseline assessments?

Baseline data was collected on students in both Grades 1 and 2 and assessed against endline scores. The baseline assessment shows, for example:

- **50%** of baseline Grade 2 students were able to read a story in **English** and **49%** in **Kiswahili**. Meanwhile, **16%** of the baseline Grade 2 students were not even able to recognise a letter.
- In baseline Grade 2, **42%** of students were able to do division, compared to just **2%** in baseline Grade 1.





RESEARCH QUESTIONS

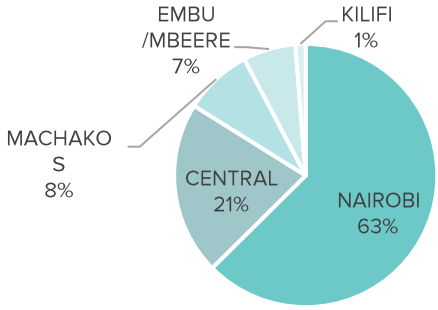
Opportunity International EduFinance works through partnerships with financial institutions to provide **School Improvement Loans** and **Education Quality services** to affordable non-state schools in low- and middle-income countries.

As schools undertake efforts to improve their quality through school leadership and teacher mentor professional development training and make investments in their schools, EduFinance wants to better understand:

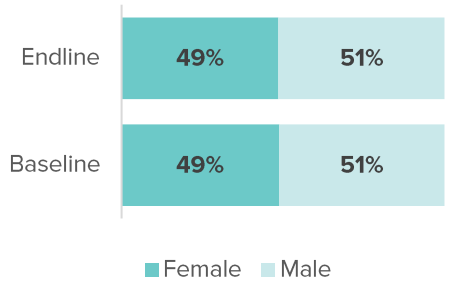
1. How effective is the **EduQuality program** in increasing **learning outcomes** for students?
2. How effective are **school investments** in increasing **learning outcomes** for students?
3. Do any assessments of impact derived by the EduQuality program or school investments extend to **girls** and/ or students coming from **lower socioeconomic backgrounds**?

Population and Sample of the Study

County breakdown



Student Gender



Geography	Assessed			Key Figures				
	Schools	Students	Avg	Pupils	Teachers	PTR	Schools With Loan	% Schools with Loan
Control Group								
CENTRAL	13	298	**22.9**	192	9.5	20.1	5	38.5%
EMBU /MBEERE	4	108	**27.0**	183	9.8	18.8	3	75.0%
KILIFI	1	25	**25.0**	196	11.0	17.8	0	0.0%
MACHAKOS	5	116	**23.2**	364	18.0	20.2	2	40.0%
NAIROBI	43	993	**23.1**	223	10.1	22.0	11	25.6%
EduQuality Group								
CENTRAL	26	596	**22.9**	241	13.3	18.0	11	42.3%
EMBU /MBEERE	8	163	**20.4**	121	6.1	19.7	3	37.5%
KILIFI	1	28	**28.0**	234	12.0	19.5	1	100.0%
MACHAKOS	11	236	**21.5**	155	8.6	18.0	7	63.6%
NAIROBI	85	1,633	**19.2**	217	10.5	20.6	21	24.7%
Summary								
Control School	66	1,540	23.3	220	10.4	21.2	21	31.8%
EdQ School	131	2,656	20.3	209	10.6	19.7	43	32.8%
Total	**197**	**4,196**	**21.3**	**206**	**10.2**	**20.2**	**64**	**32.5%**
Median Control School			**27.0**	**163**	**10.0**	**16.3**		
Median EdQ School			**25.0**	**169**	**9.0**	**18.8**		

BACKGROUND & CONTEXT

Literacy and **numeracy** are the foundations upon which all other literacies are built. Education has a significant impact on an individual's ability to generate income and become productive members of society.

At scale, this individual impact can have dramatic economic consequences for a nation. Household studies have repeatedly demonstrated in developing countries that an additional year of education results in increased income generation to the student over the course of their life (Peet, E., Fink, G. and Fawzi, W., 2015). This is more pronounced in Africa (9.6% annual return to a year of education) than Latin America (8.6%), Eastern Europe (6.3%) and Asia (4.4%). These figures have driven governments worldwide to focus their attention on getting more children into school.

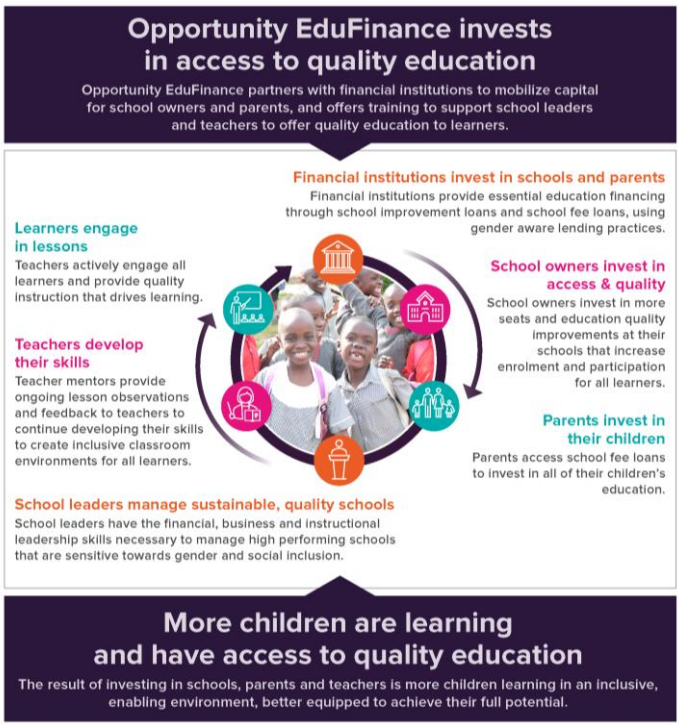
While enrolling children into school in the first place is a first order challenge worldwide, enhancing the quality of those schools' facilities and enabling them to deliver better learning outcomes and reduced dropouts remains of similar crucial importance. In 2015, the United Nations adopted Sustainable Development Goal (SDG) 4, focused on 'inclusive and equitable quality education for all.'

The Education Quality program of Opportunity International EduFinance partners with affordable non-state schools in low- and middle-income countries to continue improving the quality of education for students. This includes school development planning, School Leadership Professional Development and Teacher Mentor Professional Development training and support.

Teacher Mentor sessions specifically provide hands-on, interactive training on best practice teaching techniques, with a pedagogical focus on literacy. Training also equips mentors to deliver professional development training and coaching to peer teachers.

Key topics include:

- Engaging all Learners
- Positive Behavior Management
- Phonics
- Planning a Lesson
- Checking for Understanding
- Leading Teacher Professional Development
- Leading Coaching



WHY ASSESS LEARNING OUTCOMES?

Opportunity EduFinance's theory of change's desired long-term impact is that **more children are learning and have access to quality education.**

EduFinance believes that the **quality of education outcomes** can be increased through:

- Provision of affordable financing for schools and parents
- Teacher mentorship and professional development
- School leadership training and planning

Answering these questions enable EduFinance to identify its effectiveness and incentivize schools to direct efforts and resources towards improvement of child learning outcomes.

Investments in **leadership training** have generally shown benefits to learning outcomes (World Bank, 2018), due to its impact on nearly every aspect of a schooling system including, but not limited to, **school culture, school management, and teaching and learning**. Studies also show that schools with better management capabilities have better test scores, with these results being found regardless of region and type of education system (Bloom, 2015).

Better management of schools, where school principals and headteachers are actively involved in school development planning, assisting teachers with lesson planning and goal setting, can prioritize learning among their students above all else. This results in better utilization of resources and has been demonstrated to drive improvements in learning outcomes (Education for All Global Monitoring Report, 2015).

How were learning outcomes previously assessed?

Prior to the Quasi-Experiment, EduFinance's Monitoring, Evaluation & Learning (MEL) department has collected data on learning outcomes by capturing **national examination scores**. These scores were self-reported by 680 schools to the M&E data enumerator.

In **2020**, together with **Radical Innovation for Social Change (RISC)** of the University of Chicago, EduFinance was able to establish that schools receiving financing outperformed Ugandan peer school examination scores, which was statistically significant over time.

However, this study still had some limitations:

- The sample size for Education Quality partner schools was small
- National examination scores also have problems: These are self-reported measures, not tracked by all schools; it is an imperfect indicator of learning (focus on rote memorization), and; some schools only put children up for examination that they think will do well.

Percentile points improvement from **School Improvement Loans**

OPPORTUNITIES FOR FURTHER STUDY

The 2021-23 quasi-experimental study has been able to identify that schools in Kenya that are taking out School Improvement Loans, as well as schools in the Education Quality program **are demonstrating greater learning outcomes than those who are not.**

This builds on previous findings from Uganda conducted with RISC, as well as findings that School Improvement Loans have resulted in higher quality facilities at schools. However, it is still early to assess whether there was a statistically significant increase over time through a cohort study. This is because the study was conducted at a single point in time. **A future, controlled study should include a Randomised Control Trial (RCT).**

The future RCT would be conducted by identifying schools to participate in the sample **before they take out their first School Improvement Loan** and recording their baseline statistics at that time. Comparing the baseline result to the resulting value of the dependant test variables at the end of the term of the loan (2-3 years later, on average) would result in a more conclusive assessment.

Such a study would also benefit from a more granular **child level approach**; however, funding constraints are typically a major barrier to this, especially in the case of NGOs conducting the study. Measuring children's reading and writing skills, using an early learning outcomes measure (ELOM) indicator such as the well-established Early Grade Reading Assessment (EGRA) and Early Grade Mathematics Assessment (EGMA) or Pratham's Annual Status of Education Report (ASER) would offer clear indications of children's learning outcomes and evidence of whether schools are improving in terms of quality.

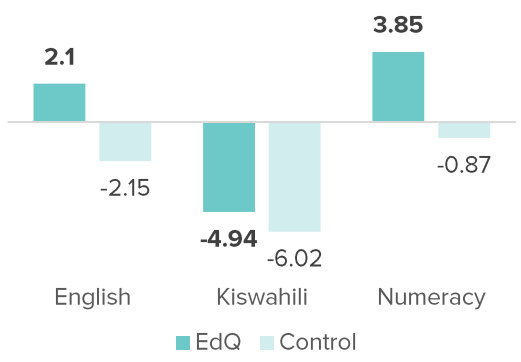
APPENDIX: VISUALIZING THE CHANGES

Additional Descriptive Data - Change in Pass Rates

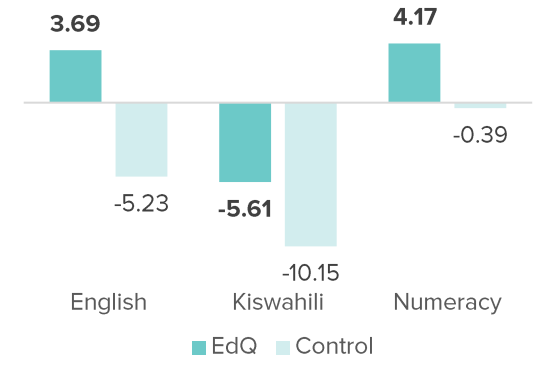
The below descriptive data shows that **endline results for Education Quality partner schools are typically better than control schools,** but this does not necessarily reflect any change related to the intervention, as **control schools may have already been performing with lower rates to begin with.**

The graphs below show the *change in pass rate* from **baseline** to **endline** at control and Education Quality schools, followed by the same measure among **female** and **low socioeconomic bracket students.**

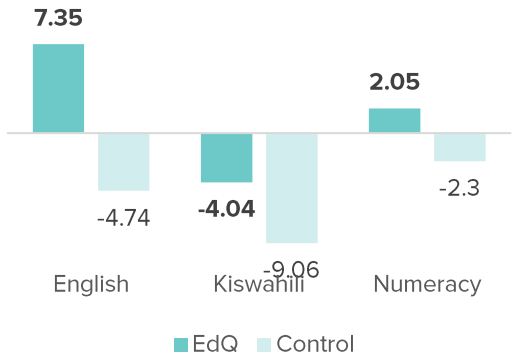
% Change in Pass Rates: **All Students**



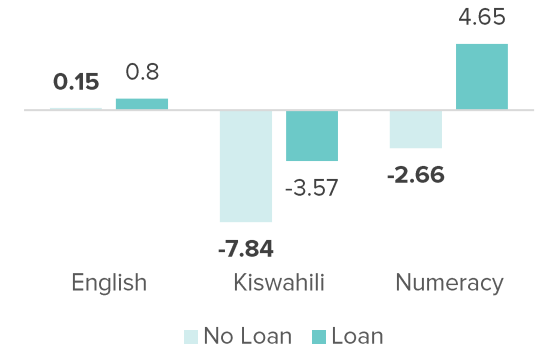
% Change in Pass Rates: **Females**



% Change in Pass Rates:
Lowest Socioeconomic Bracket



% Change in Pass Rates:
School Loans

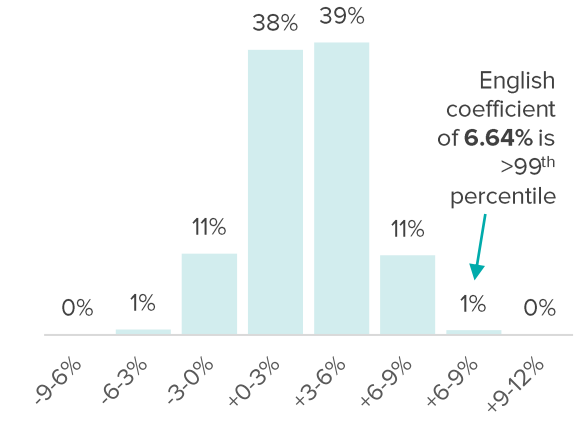


APPENDIX: VISUALIZING THE CHANGES

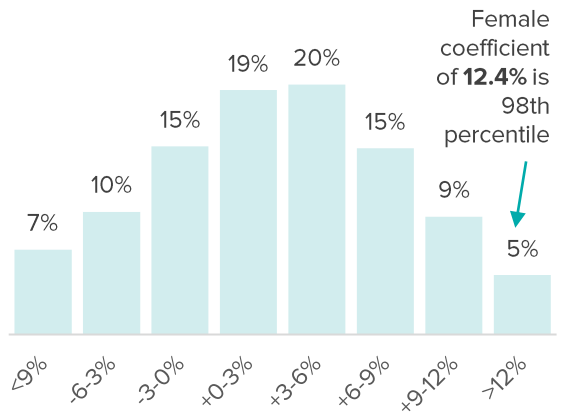
Confirming the regressions using Monte Carlo simulations

For each of the **five variables** which were found to be significant by the analysis, a simulation of 10,000 scenarios was conducted based on the standard deviations of results. For each of the variables, it confirms that there is at least a 99% chance that the results deeming the result to be positively significant were true.

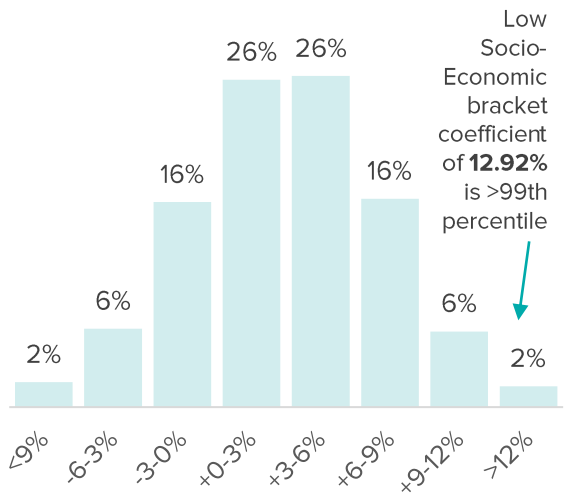
Results of Monte Carlo Simulation on **English Coefficient**



Results of Monte Carlo Simulation on **Female English Coefficient**



Results of Monte Carlo Simulation on **English Coefficient for Low Socioeconomic Bracket**



Results of Monte Carlo Simulation on **Maths Coefficient**