Trent Bellinger, Joao Panicali, Ian Milstein
Improving Quality of Primary Education Program (IQPEP) in Ethiopia

We will be investigating a USAID program (IQPEP) that had the goal of improving education in Ethiopia. Between 2009 and 2014, IQPEP aimed to improve teacher training by promoting fundamental changes in the teaching process, specifically for teaching reading. This problem is interesting to us because it will allow us to see if the proposed teaching improvements were successful in Ethiopia, which will give insight as to whether similar improvements will be successful in other countries. The main report that we have examined is a study done by USAID to determine the efficacy of these teaching improvements. This report gives a comprehensive background of the study and the techniques used in the control and treatment groups. While the IQPEP reported results using t-tests and multiple regression, they did not use sophisticated causal inference techniques to evaluate the effectiveness of the program. For example, they did not utilize variance reduction techniques, which could have led them to claim that some results were insignificant when they actually were. Additionally, the study didn't do any heterogeneous effect analysis, which could be useful in identifying avenues to make the intervention more effective and its deployment more efficient. Lastly, the study framed the analysis at the school level but analyzing the data at the student level could uncover valuable insights, particularly when coupled with an analysis of heterogeneous treatment effects. The study includes data collected from students throughout Ethiopia utilizing a design similar to SRE over a 4-year period. The data contains various covariates about each student, whether their school used the improved teaching technique, and their reading and verbal comprehension scores. The data was recorded among the same group of schools, where only some of which participated in the program, and evaluated second and third grade students on the same tests 4 years apart. While we are measuring the student's linguistic proficiencies, the quantity of interest is the effect the program had on the teachers' ability to teach.

Besides the original study, we will utilize papers on causal methodological techniques to inform our own methods, including papers on metalearners, AIPW, regression adjustment, etc. Finally we will also review research done on educational interventions in Ethiopia and developing countries more broadly to provide more context and serve as a point of reference for our research. The methods we expect to deploy in our analysis fall into three broad categories. First, we will utilize variance reduction techniques, particularly Lin's estimator as a form of regression adjustment at the school level. Second, we will utilize techniques that allow us to analyze the data at the student level with reduced bias and variance, particularly AIPW. Lastly, we will utilize metalearners (e.g. X learners) to estimate heterogeneous treatment effects at the school and student level. Qualitatively, we expect to be able to present the difference between different covariate "groups," whether that be matching students or stratifying by school or region. Quantitatively, we will examine our variance estimates, p-values, and confidence intervals to make sure they line up with a general consensus of the study and be able to rigorously explain any new findings through our methods.

Bibliography

Methods
Heterogeneous treatment effects: Künzel, Sören R., et al. "Metalearners for estimating heterogeneous treatment effects using machine learning." *Proceedings of the national academy of sciences* 116.10 (2019): 4156-4165.
AIPW: Glynn, Adam N., and Kevin M. Quinn. "An introduction to the augmented inverse propensity weighted estimator." Political analysis 18.1 (2010): 36-56.
Lin's estimator (Lin, 2013)

Context
Kim, J. (2020). Unpacking the Role of Early Learning in Student Learning Outcomes: Evidence from National Reform of Pre-primary Education in Ethiopia. https://doi.org/10.17863/CAM.46120
Iyer, P., Rolleston, C., Rose, P., & Woldehanna, T. (2020). A rising tide of access: what consequences for equitable learning in Ethiopia? Oxford Review of Education, 46(5), 601–618. https://doi.org/10.1080/03054985.2020.1741343
Dubeck, Margaret M., and Amber Gove. "The early grade reading assessment (EGRA): Its theoretical foundation, purpose, and limitations." International Journal of Educational Development 40 (2015): 315-322.

Original Project/Data
United States Agency for International Development. Ethiopia USAID Education Data. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2025-08-26.
https://doi.org/10.3886/E237384V1