

The impact of a multifaceted education program on early grade literacy and math outcomes in Zambia: Evidence from a Mixed-Methods Cluster-Randomized Controlled Trial

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Abstract

Background

Low- and middle-income countries have made significant progress toward placing children into schools, but student learning and achievement are often dreadfully low (Berry, Barnett, & Hinton, 2015; Pritchett, 2013). Approximately 250 million children across the world are not acquiring basic reading and mathematics skills, even though about half have spent at least four years in school (United Nations Educational, Scientific, and Cultural Organisation [UNESCO], 2014).

Zambia faces many common educational challenges. Literacy rates among young Zambian adults ages 15–24 are 58.5% for females and 70.3% for males, despite an average of 7.7 years and 7.9 years of education, respectively (Central Statistical Office, Ministry of Health, & ICF International, 2014; UNICEF, 2015). Zambia also has a large, autonomous community schooling system that expanded during the past 20 years to increase education access in remote areas: the number of Zambian community schools has increased from 100 schools in 1996 to about 3,000 schools with 600,000 children in 2014 (Chimese, 2014; DeStefano, 2006). However, many community schools in Zambia are staffed by untrained and underpaid teachers who teach a substandard curriculum and who lack management skills and school supplies. These schools need a cost-effective solution for delivering quality education in order to improve learning outcomes.

Program Description

The eSchool 360 model implemented by Impact Network represents a promising approach to improving educational outcomes by incorporating three potentially high-impact components that could create important synergies: e-learning, ongoing teacher training and professional development, and community ownership. Combining these components into a single program may be particularly effective by aligning all three factors toward improving the educational outcomes of students.

Methods

We designed and are implementing a mixed-methods cluster-randomized controlled trial (cluster-RCT) to determine the effects of Impact Network's eSchool 360 model. The study comprises three main evaluation components: an impact evaluation of the eSchool 360 model, an analysis of the cost-effectiveness of the eSchool 360 model, and a process evaluation of the expansion of the eSchool 360 model. To determine the impact of the program, we are using a cluster-RCT in which 64 eligible schools have been randomly assigned either to receive Impact Network's eSchool 360 program (30 treatment schools) or not to receive the program (34 control schools).

The primary cognitive skills outcomes are aggregate scores on the early grade reading assessment (EGRA), early grade mathematics assessment (EGMA), the Zambian Achievement Test (ZAT), and oral vocabulary assessments. The population consists of children ages 6–9 who live in close proximity to the 64 selected community schools across three districts—Petauke, Sinda, and Katete—in Zambia's Eastern Province.

This presentation will focus on the midline results of the cluster-RCT used to determine the impact of Impact Network's eSchool 360 model. We will present the impact of the program on EGRA, EGMA, ZAT, and oral vocabulary assessments one year after the start of the program. In addition, we will present the impact of the program on intermediate outcomes, including school attendance and enrollment, perceptions of school and education quality, aspirations about child's education and marriage, child development, food security, and education expenditures.

Quantitative Results

We found statistically significant Intention-to-Treat (ITT) effects on learning outcomes across the board. On average, we found statistically significant effects of 0.34 standard deviations on EGRA scores, 0.14 standard deviations on EGMA scores, 0.11 standard deviations on ZAT scores, and 0.22 standard deviations on oral vocabulary scores 14 months after program start.

Treatment Effects on the Treated (TOT) showed larger impacts for students who started attending the Impact Network schools. On average, attending the Impact Network schools resulted in improvements of 0.26 standard deviations in ZAT scores, 0.70 standard deviations in EGRA scores, 0.30 standard deviations in EGMA scores, and 0.45 standard deviations in oral vocabulary scores.

The results indicate that improvements in the quality of education and increases in school attendance contributed to the positive effects on EGRA, EGMA, ZAT, and oral vocabulary scores. We found statistically significant effects of the eSchool 360 model on parents' satisfaction with education and school attendance. In addition, we found strong and statistically significant correlations between parents' satisfaction with education and school attendance with EGRA, EGMA, ZAT, as well as oral vocabulary scores.

We found less evidence for the contribution of other potential mechanisms to improvements in EGRA, EGMA, ZAT, and oral vocabulary scores caused by the eSchool 360 model. Although we found strong and statistically significant correlations between school enrollment and learning outcomes, we found only a small and marginally significant effect of the eSchool 360 model on school enrollment. Similarly, we did not find statistically significant effects of the eSchool 360 model on child development outcomes.

Qualitative Results

Qualitative respondents (students, teachers, parents, and program staff) also reported a high perceived quality of education at Impact Network schools. Their experiences suggest that Impact Network schools provided a higher quality education than government schools and that teachers were present far more regularly at Impact Network schools than at government schools. They also attributed improvements in literacy outcomes to the Impact Network schools. However, they did not report improvements in mathematics.

The qualitative research also showed evidence for a high level of fidelity of implementation, which likely contributed to the positive effects. The findings suggested that teachers used the participatory pedagogical approaches on which they were trained; that they adhered to the curriculum prescribed in the curriculum map; and that they used technology (tablets and projectors) as recommended.

Despite the positive program effects, children residing in Impact Network catchment areas scored an average of only 11% correct on EGRA assessments and 24% correct on EGMA assessments. That is, they scored approximately 3 percentage points higher than the control group for both EGRA and EGMA outcomes.

References

- Berry, C., Barnett, E., & Hinton, R. (2015). What does learning for all mean for DFID's global education work? *International Journal of Educational Development*, 40, 323–329.
- Central Statistics Office Zambia (2013). *2010 census of population and housing: Population and demographic projections 2011–2035*. Retrieved from <http://www.zamstats.gov.zm/index.php/publications/category/11-2010-census>
- Chimese, K. (2014). *A case of vulnerables teaching OVCs*. Retrieved from http://zambiaopencommunityschools.org/news/a_case_of_vulnerables_teaching_ovcs_100011.php
- DeStefano, J. (2006). *Meeting EFA: Zambia community schools* [Educational Quality Improvement Program 2]. Washington, DC: United States Agency for International Development. Retrieved from <https://www.epdc.org/sites/default/files/documents/Zambia%20Community%20Schools.pdf>
- Pritchett, L. (2013). *The rebirth of education: Schooling ain't learning*. Washington, DC: Center for Global Development.
- UNICEF. (2015). *The state of the world's children 2015: Executive summary*. Retrieved from http://www.unicef.org/publications/files/SOWC_2015_Summary_and_Tables.pdf.
- United Nations Educational, Scientific, and Cultural Organisation. (2014). *Teaching and learning: Achieving quality for all* [EFA Global Monitoring Report 2013–14]. New York, NY: Author. Retrieved from <file:///C:/Users/dmorton/Downloads/Teaching%20and%20Learning%20-%20Achieving%20Quality%20for%20All.pdf>