More School Resources, Better Teacher Incentives, or Both to Improve Student Learning in Tanzania

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Sector(s): Education

Fieldwork: Innovations for Poverty Action (IPA)

Location: Tanzania

Sample: 350 schools

Target group: Primary schools Students Teachers

Outcome of interest: Student learning

Intervention type: Cash transfers Monetary incentives Unconditional cash transfers

AEA RCT registration number: AEARCTR-0000291

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Partner organization(s): Twaweza

Improving education quality in low-income countries is a top priority for the global human development agenda, with governments and donors spending over a hundred billion dollars annually on education. Researchers evaluated the impact of providing schools with an unconditional cash grant, a teacher incentive program, or both on student learning. The cash grant had no impact on student learning, while the teacher incentive program had mixed results. However, combining both programs together had an even greater impact on student learning compared to the sum of the effects from each individual component alone. These results suggest that combining spending on school inputs with improved teacher incentives could substantially increase the cost-effectiveness of public spending on education.

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Improving education quality in low-income countries is a top priority for the global human development agenda, with education accounting for a sixth of government spending in low- and middle-income countries and totaling over fifteen billion dollars in aid. Despite major investments, education systems in low-income countries have found it difficult to convert increased investment into improved student learning. One reason may be that education systems face additional constraints beyond limited resources, so simply providing more resources may have a limited impact if other barriers persist. Specifically, low teacher effort may limit the effectiveness of additional inputs, with high rates of teacher absence documented across several low-income country settings.

Can a combination of additional school resources and incentives aimed to increase teacher effort together lead to greater impacts on student learning than the sum of doing both independently?

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Tanzania has made striking progress towards universal primary education with enrollment rates growing from 52 percent in 2000 to over 94 percent in 2008, partly due to implementing free public primary schools in 2001. Yet, despite this increase in school enrollment, student learning levels remain low. Based on 2012 national learning assessments, less than a third of grade three students were proficient at a grade two level in Kiswahili (the medium of instruction). One barrier to student learning may be that schools simply lack the resources to provide a quality education. Despite considerable public spending on education in Tanzania, spending has not kept pace with rapid increases in enrollment, leading to under-resourced schools. For example, there was only one math textbook for every five children in grades one, two, and three in 2012. Another barrier may be that low teacher motivation and effort hinder educational quality. A 2010 study found that nearly one in four teachers in Tanzania were absent from school on a given day and students received only about two hours of instruction per day, less than half of the scheduled time.[1]

After documenting low learning levels in East Africa during a previous program, Twaweza, an East African civil society organization, conducted extensive discussions with education stakeholders to identify key barriers to improving learning. They found that inadequate school resources and poor teacher motivation and effort were the two most commonly reported barriers. To address these challenges, Twaweza created and implemented the KiuFunza program (KiuFunza means “thirst for learning” in Kiswahili) in public schools across the country from 2013 to 2014.

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Researchers conducted a randomized evaluation to test the impact of providing an unconditional school grant, teacher incentive program, or both on student learning. All programs were implemented by Twaweza, in close coordination with the government. Within ten randomly selected districts across Tanzania, researchers randomly selected 35 public schools within each district (for a total sample of 350 schools covering 120,000 students). These schools were mostly rural, with an average of enrollment around 730 students and large class sizes of over 55 students per teacher. The student gender ratio was evenly balanced and the average student was 9 years old. Researchers randomly allocated the schools to one of four groups:

- Unconditional School Grants: 70 schools received TZS 10,000 (US$6.25) per student from Twaweza, nearly triple the average spending per student before the program. Grants were sent directly to the school bank account in two disbursements around April and August/September. The head teacher and school board decided how to spend the funds, but schools had to maintain financial records and share them with the community.
- Teacher Incentives: 70 schools received a teacher incentive program that provided cash bonuses to teachers and head teachers for each student that passed an independent test conducted by Twaweza. Bonuses were limited to grades one, two, and three and based on test scores in math, English, and Kiswahili. For each student who passed each subject, an eligible teacher earned TZS 5,000 (US$3) and a head teacher earned TZS 1,000 (US$0.6). For reference, a teacher with average enrollment could earn up to 125 percent of their monthly salary as a bonus.
- Combination: 70 schools received both the unconditional school grants and the teacher incentives program.
- Comparison: 140 schools received neither the unconditional school grants nor the teacher incentives program.

Two types of student assessments, “low-stakes” and “high-stakes,” provided data on student learning. In October 2013 and 2014, researchers conducted low-stakes tests that sampled ten random students from grades one, two, and three from all schools, comprising of 10,500 students overall to measure student learning in non-incentivized tests. At the end of the school year in November, Twaweza conducted high-stakes tests that determined teacher bonuses and were taken by all grades one, two, and three students in both the incentive and combination schools, but not in grant schools. Additionally, researchers collected data on school expenditures and conducted surveys to understand teacher effort and a student’s household involvement in their education.

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Providing school grants alone had no impact on student learning. However, providing teacher incentives led to some positive effect on the high-stakes tests only, and combining the grant and incentives had large positive impacts on student learning on both tests. Though increased funding towards school inputs, like the grant program, has often failed to improve student learning, this study suggests that teacher incentives can be particularly effective in combination with increased inputs.

No Impact of Unconditional School Grants: Over the two years, schools that received a grant increased their total per-student spending by 4,700 TZS (US$3) from a baseline of 5,200 TZS (US$3), a 89 percent increase. Moderate reductions in other school and household expenditure partially diminished the impact of the grant on per-student spending but did not fully offset the impact of the grant. On average, schools spent 65 percent of the grant on textbooks and classroom teaching aids, while also saving around 30 percent of the money, perhaps to prepare for uncertain government funding once the two year grant program ended. Despite significant increases in spending, there was no difference in test scores between schools that did and did not receive the grants. Such results were consistent with the existing body of evidence that simply increasing school resources rarely improves student learning outcomes in low-income countries.

Teacher Incentives Increased Performance on High-Stakes Tests: The incentives program did not have an impact on student learning on low-stakes tests but did improve scores on the high-stakes tests. Teacher incentives increased test scores on the high-

stakes tests by 0.17 standard deviations in math and 0.12 standard deviations in both Kiswahili and English relative to student's tested in the comparison group. Students in schools that received the teacher incentives were also more likely to pass these high-stakes tests. Researchers hypothesize that differences in outcomes between the low- and high-stakes tests could be attributed to differences in student effort and testing conditions. Low-stakes tests were administered to a sample of students during a regular school day. In contrast, the high-stakes tests were more "official" as all students in grades 1-3 were tested on an agreed test day. In addition, most schools used the incentivized test as the end of year exams.

Grants and Incentives Together Led to Large Impacts on Learning: The combination of the grant and the incentive programs led to higher scores on both the low-stakes and high-stakes tests across all tested subjects. On the low-stakes tests, students in combination program schools scored 0.20, 0.21, and 0.18 standard deviations higher on math, Kiswahili, and English respectively after two years relative to students' test scores in comparison schools. On the high-stakes tests, students scored 0.25, 0.23, and 0.22 standard deviations higher on math, Kiswahili, and English respectively after two years relative to the comparison group. Improvements were even greater for girls and students with lower initial test scores. After two years, students in the combination schools also scored higher on science tests, which were not incentivized, suggesting that teacher incentives for math and language test scores did not hurt learning in other subjects. Researchers suggest that one mechanism driving these improvements in student learning was increased teacher effort and greater effectiveness of additional effort due to more resources.

Combining Grants and Incentives Led to Even Greater Impacts: The impact of the combination program after two years was considerably greater than the sum of the impacts of the grant and incentives programs when implemented separately, suggesting that the two programs were complementary. Based on results from the low-stakes test scores, the effect in combination schools was over three times the size of the sum of the impact of the Grant and Incentives schools in the first year, and over five times greater in the second year.

Cost-effectiveness: Based on the high-stakes tests, the cost of increasing test scores by 0.1 standard deviation per student was USD 3.38 in incentivized schools and USD 3.69 in combination schools. Spending all the money on the incentives may be as, or more, cost-effective than spending on a combination of grants and incentives. Implementing the teacher incentives program through regular teacher salary increases with an additional performance-based bonus could reduce the cost of the programs and improve their cost-effectiveness.

Based on these results, the Tanzanian government decided to issue unconditional cash grants directly to schools starting in January 2016. Previously, the government disbursed funds through local governments, but, on average, schools received only about 60 percent of allocated funding. This evaluation showed that while the grants alone did not increase learning, sending money directly to schools is transparent, easy to implement, and results in increased learning resources for schools.

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1. World Bank. 2012. *Tanzania Service Delivery Indicators*. Washington, DC.: World Bank.