The Impact of Learning to Teach by Learning to Learn on Student Outcomes in Uganda

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Sector(s): Agriculture, Education

Fieldwork: Kimanya-Ngeyo, IPA Uganda

Location: Jinja District, Uganda

Sample: 29 schools

Initiative(s): Innovation in Government Initiative (IGI), Post-Primary Education Initiative (PPE)

Target group: Parents Students Teachers

Outcome of interest: Student learning Cognitive development Service provider performance

Intervention type: Training Norms change Pedagogical innovation

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Approaches to teaching that promote rote-learning and one-way flow of information from teachers to students—often referred to as the “banking model” of education—can limit student learning. Researchers, in partnership with Kimanya Ngeyo Foundation for Science and Education in Uganda, evaluated the impact of a program that trained teachers to learn like scientists: posing questions, framing hypotheses, and using real-world experience wherever possible. They explored how this approach to training teachers changed teacher pedagogy, classroom dynamics, student learning, and creativity. Researchers found positive impacts along all these dimensions, with impacts on student learning sustained for four years.

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Despite gains in school attendance over recent decades, large learning gaps persist, especially in low- and middle-income countries. Poor teaching practices based on rote learning is one reason for this issue, leading governments to spend significant resources on teacher training to improve student learning. However, evidence on effective alternative pedagogical practices is limited. Many successful teacher training programs focus on building discrete skills or following a specific curriculum; however, these programs are usually more effective for young children. They may be less applicable for teaching adolescents who are expected to learn much more material and develop increasingly complex competencies.

A broad-based change in teachers’ instructional techniques could equip students with transferable skills like finding answers themselves in diverse applications and contexts. However, teachers are seldom trained on how to teach students to think critically, ask questions, and reflect on their learning. Might teachers benefit from learning how to learn in a scientific, interactive,

and inquisitive manner themselves? If so, can this “learning to learn” approach create a more interactive learning environment and ultimately improve student outcomes?

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Nearly all primary age students in Uganda attend primary school, but in the late 2000s, only 59 percent of Ugandan primary school graduates continued onto lower secondary school. This learning lag was pronounced in Budondo sub-county, where the intervention was focused. For instance, in 2017, some students in Grade 7 were 18 years old, indicating significant grade repetition and slow learning. Teachers in Budondo had limited teacher training. Only 24 percent of teachers had post-secondary degrees, and 21 percent had taken part in any training program during their time as teachers prior to the intervention. These teachers generally had a wide range of responsibilities; 43 percent taught Grade 6 and Grade 7 in addition to other classes.

Kimanya Ngeyo (KN), a Ugandan NGO, trains teachers in an “active learning” teaching method. KN often conducts its trainings using carefully selected modules from the Preparation for Social Action (PSA) Program[1], a program that emphasizes the learner’s role in discovery and the teacher’s role as the learner’s guide. The training program prepares teachers to integrate scientific approaches to learning with social action in communities by developing capabilities in four areas: language, mathematics, science, and process of community life (such as production on small farms, maintaining health, waste management, environmental issues and more).



A Preparation for Social Action (PSA) Teacher Training tutor exchanges with teachers in a training

Photo: Kimanya-Ngeyo Foundation for Science and Education

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Researchers partnered with KN to conduct a randomized evaluation to test the impact of PSA on teacher motivation and student learning in Uganda. As part of the year-long in-service training using materials from the PSA program, teachers participated in three two-week trainings during term breaks. KN tutors visited teachers approximately once per term to observe their classroom behavior.

During in-person trainings, teachers engaged in practical exercises to link academic readings with everyday experiences—a diversion from the typical training in which teachers passively listen to lectures. For example, teachers were prompted to discuss their own attitudes on the purpose of education and correlate and contrast these attitudes with educational design principles embedded in the PSA texts. The exercises were geared to help teachers think and act more consciously about instruction strategies that facilitate discovery and curiosity in their students.

Researchers randomly divided 35 primary schools in the Budondo sub-county into the following two groups:

1. *Training group (18 schools)*: Schools in this group were invited to send two to three primary school teachers to attend the year-long PSA training in both 2018 and 2019. Teachers did not receive payment for attending trainings other than a transport subsidy, but approximately 65 percent of teachers attended a majority of the sessions.
2. *Comparison group (17 schools)*: Schools were not invited to send teachers to the PSA trainings.

To measure changes in teachers' pedagogy, classroom behavior, and thinking skills, researchers conducted interviews with both teachers and students about their experiences and practices in the classroom. Furthermore, they observed classroom sessions to measure student-teacher relations. To measure students' learning outcomes, researchers collected student scores on the Primary Leaving Exams (PLE), qualifying exams for secondary school. In the second year of implementing PSA, students also participated in science shows designed to measure their ability to design experiments, articulate hypotheses, record observations, and communicate results. These data were collected in the second half of 2019, after the training of the first two cohorts of teachers. In 2022, four years later, the researchers measured student and teacher outcomes again.

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Students in schools whose teachers were offered the PSA training improved their standardized exam scores. Teachers at trained schools knew more about their students' lives and took more time to learn from one another. Up to four years after the PSA training was administered, students exposed to trained teachers had higher test scores and progressed through more grade levels than students who were not.

Teacher pedagogy: More students in schools where teachers were offered training were engaged relative to students in comparison schools, where an average of about half of the students were engaged. In training schools, 28 percent of students reported asking questions in class when they did not understand a concept, against 22 percent in the comparison group (a 27 percent increase).

Teacher effort: Teachers at training schools put more effort into their work and professional development. They were 10 percentage points more likely to accurately recall their students' attendance and living conditions compared to 62 percent of teachers at comparison schools (16 percent increase), suggesting greater knowledge of their students. They were 9 percentage points more likely to report forming a learning relationship with their colleagues relative to 60 percent of teachers in the comparison group (15 percent increase), demonstrating that they were invested in their own learning.

Traditional learning outcomes: After the first year of teacher training, students who attended a school invited to participate in the training were 24 percentage points more likely to pass the PLE examination compared to 51 percent in the comparison group (47 percent increase). Students in Grade 6 were 12 percentage points more likely to transition to Grade 7, relative to 81 percent of their peers in the comparison group (15 percent increase).

Critical thinking and creativity: Students in classrooms at schools invited to participate in the training scored higher on questions measuring their applied understanding of concepts (by 0.73 standard deviations) and critical thinking (by 0.45 standard deviations) relative to the comparison group. Furthermore, in the science shows, students in the training schools received higher ratings on designing experiments, articulating and analyzing hypotheses, measuring observations, and communicating results by 33 percent.

Long-run learning outcomes: In 2022, children who were enrolled in the primary schools invited to receive the training were 10 percentage points (16 percent) more likely to be enrolled in secondary school compared to 62 percent of children in the comparison group. On average, they also performed better on a secondary school assessment (by 0.39 standard deviations) than students from comparison schools. When it comes to math learning, students who were exposed to trained teachers between Grades 4 to 6 made large improvements to their scores (ranging from 0.43 to 0.59 standard deviations), unlike students who had trained teachers only in Grade 7, demonstrating the benefits of improved teaching for building foundational math skills.

Long-run teacher outcomes: Four years after the program, teachers from training schools had similarly content knowledge and critical thinking scores as teachers in comparison schools, likely due to already high scores in the comparison group. However, teachers offered the training sustained their understanding of the training program's core concepts, like their ability to distinguish terms like "understand" and "know".

Cost effectiveness: The trainings were cost-effective for improving learning. Researchers estimated that the intervention produced an additional 9.62 years of high-quality education per US$100 spent, ranking it in the top 5 percent of interventions analyzed along this metric.

The researchers are exploring opportunities to adapt the program through government systems, . In particular, they are working with the Ugandan Ministry of Education to scale the approach in a set of teacher training colleges. Additionally, ongoing research is exploring impacts of this study on community-level outcomes and whether a similar training model can be applied in other contexts ranging from secondary schools to agricultural extension programs.

Nourani, Vesall, Nava Ashraf, and Abhijit Banerjee. "Learning to Teach by Learning to Learn," Working paper, February 2025.

1. "Preparation for Social Action," FUNDAEC, 2021, https://fundaec.org/en/preparacion-para-la-accion-social/.