STUDY SUMMARY

Improving Numeracy Instruction for Young Children in Peru

In Peru, a majority of children perform below their grade level in math. Researchers evaluated the impact of an innovative math skills program on kindergartners' numeracy and ability to recognize shapes. Results showed that the program significantly improved math scores immediately after the program ended, but the impacts had mostly dissipated one year after the program ended.

Policy Issue

In recent years, most regions of the world have achieved near-universal primary school enrollment. However, the increase in coverage has not corresponded with improvements in student learning. For example, in Peru, the net primary school enrollment rate was 94 percent in 2011.[1] However, nationwide tests in 2012 showed that 87 percent of seven-year-olds had not achieved the expected level of competency for their age in math; this number reached 96 percent in rural areas.[2] Furthermore, the 2012 Program for International Student Assessment (PISA)—which is a worldwide study of 15-year-olds' scholastic performance—ranked Peru last out of 65 countries in math, science, and reading.[3]

In order to address such low test scores, particularly in the area of mathematics, some organizations have created innovative educational programs as an alternative to rote learning and memorization. This study assesses the impact of an innovative mathematics program in Peru.

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COUNTRY
Peru

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PROGRAM AREA
Education

TOPIC
Education Quality

TIMELINE
2012-2014

Evaluation Context

The Apoyo Institute—a Peruvian non-profit that carries out research and outreach on educational and social programs—developed the *Mimate* ("Mathematics for All") program to improve Peruvian kindergarteners' performance in mathematics. The program aims to teach children the basic elements of numbers and shapes through games, group or pair activities, and other interactive activities. Instructors encourage logical thinking rather than memorization and guide each student toward his or her level of ability.

This study took place in public kindergarten classes in both urban and rural schools in the south-central Andean regions of Huancavelica and Ayacucho, which are among the poorest regions in Peru.

Details of the Intervention

Researchers carried out a randomized evaluation in partnership with the Inter-American Development Bank and the Peruvian Ministry of Education to evaluate the impact of the *Mimate* program on the numeracy skills of kindergartners. Researchers randomly assigned 107 schools—with a total of 2,926 children—to either the treatment group, which received the program, or the comparison group, which did not receive the program.

In treatment schools, teachers used the *Mimate* program in 45-minute sessions three times a week. Each kindergartner received an individual box containing games and learning materials to use during the sessions or during free play. At the start of the program, teachers underwent a day and a half of training on how to organize the teaching sessions and direct the activities. Teachers also attended four discussion groups throughout the year to discuss pedagogical methods and program implementation.

Before the start of the program, at the end of the year-long program, and one year after the end of the program, researchers tested the kindergartners' ability to carry out mathematical tasks, such as recognizing shapes and colors and basic addition. Students were also tested in other areas, such as cognitive ability, oral comprehension, and basic writing. In a randomly chosen subset of schools, researchers conducted a survey of classroom infrastructure and videotaped mathematics classes to understand the quality of program implementation.

Results and Policy Lessons

Overall, the *Mimate* program improved performance in math in the short term, immediately after the program ended, but these results did not persist a year after the program ended.

Program implementation: Schools receiving the *Mimate* program implemented, on average 66 percent of the 86 planned sessions. A national teacher strike disrupted the school year, meaning that teachers did not finish all the planned sessions. In classroom observations, all teachers were seen to be using the materials as instructed by the program. In comparison to teachers of regular mathematics classes at comparison schools, *Mimate* teachers were found to be more prepared with their lessons and had more patience explaining activities to students who did not understand.

Short-term results: At the end of the year-long program, *Mimate* significantly increased math scores (by 0.11 standard deviations on average). Students who had the lowest math skills before the program began and students of teachers with university degrees had the largest gains. Students scored better on tests measuring their ability to recognize geometric shapes than on those measuring their numeracy skills. This may be due, in part, to the teacher strike, which meant that many teachers covered the sessions on geometric shapes, at the beginning of the program, but did not reach the sessions on numeracy skills, at the end. The program neither harmed nor improved performance in other learning areas, such as oral comprehension, basic writing, and cognitive ability.

Medium-term results: One year after the program ended, there were no differences in overall math scores between students who had participated in the program and those who did not participate. However, students who participated in the program continued to score higher on their ability to

recognize geometric shapes.

Read a post on the Inter-American Development Bank's blog about this project here.

Sources

1.The World Bank DataBank. http://data.worldbank.org/indicator/SE.PRM.NENR.

2.Unidad de Mendición de la Calidad Educativa. “Evaluación Censal de Estudienantes 2012.” http://umc.minedu.gob.pe/?p=1405.

3.OECD. 2014. “PISA 2012 Results in Focus.” http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview.pdf.