Innovations for Poverty Action

Researchers
Emma Naslund-Hadley
Inter-American Development Bank

Juan Hernández-Agramonte
Senior Director, Embedded Labs

Staff
Kyle Holloway
Country Director, Colombia

Sara Restrepo
Research Associate

Sofia Jaramillo
Senior Research Manager

Timeline
2019

Sample Size
633 community households

Research Implemented by IPA
Yes

The Effects of a Multimedia Preschool STEM Education Program in Colombia

Abstract

Early educational experiences have been found to have a positive effect on students' choice of math and science courses in later learning as well as their career aspirations. In Colombia, researchers are conducting a randomized evaluation to test the impact of an interactive multimedia preschool program on the math and science skills of children and the gender and racial stereotypes and beliefs of children, educators, and parents.

Policy Issue

Despite significant improvements in recent decades, there is still a large imbalance in the participation of women in science, technology, engineering, and mathematics (STEM) careers compared with the participation of men. According to UNESCO, only 35 percent of STEM students in higher education globally are women, and differences are observed within STEM disciplines.[1] Studies suggest that girls' lack of participation in STEM is the result of social, cultural, and gender norms, and that girls' self-efficacy and attitudes related to STEM are strongly influenced by their immediate family environment and the wider social context. Early educational experiences have been found to have a positive effect on students' choice of math and science courses in later learning as well as their career aspirations. This study builds on previous research that has found interactive learning programs to be effective in better developing math and science skills at the preschool level. It also contributes to

literature on whether interactive preschool programs can address gender and racial stereotypes and beliefs related to STEM.

Context of the Evaluation

Tests show that students in Latin America lag behind the rest of the world in math and science skills. Within Latin America, Colombian students are performing below the OECD average in science and math among other subjects.[2] Furthermore, according to the 2015 Program for International Student Assessment (PISA) exam, boys in Colombia outperform girls in both math and science by an average of 10 score points.[3] These disparities translate into gender gaps in tertiary graduation rates, particularly in STEM. In Colombia, women hold only 32.9 percent of STEM jobs in the country.[4]

Pequeñas Aventuras is a multimedia program developed by Sesame Workshop with the support of Dubai Cares and the Inter-American Development Bank (IADB). Facilitated by community mothers, the program aims to promote the teaching and learning of mathematics and sciences at the preschool level, with a focus on gender equality. This program seeks to ensure that all girls and boys have the same opportunity to develop their scientific and mathematical thinking, feeling that they have a place in these areas of knowledge.

Details of the Intervention

Researchers are conducting a randomized evaluation to test the impact of the Pequeñas Aventuras program on the math and science skills of children and the gender stereotypes and beliefs of children, community mothers, and parents. Researchers will randomly assign 633 community households to three groups for six weeks:

1. Pequeñas Aventuras program group: Community mothers will be trained to facilitate the Pequeñas Aventuras program with children aged 4-5 years old using a teaching guide, video tutorials, and a structured lesson plan for each activity. The program includes a web series, computer games, and interactive posters that teach children STEM-related concepts;
2. Text messages group: Households will receive text messages three times per week that promote gender equality and learning on STEM-related concepts;
3. The comparison group.

Researchers will conduct an initial survey evaluating participating children’s math and science skills and the gender stereotypes and aspirations of children, community mothers, and parents. Six months later, a follow-up survey will be conducted collecting the same information as the initial survey.

Results and Policy Lessons

Study ongoing; results forthcoming.

Sources

[1]UNESCO, 2017. “Cracking the code: Girl’s and women’s education in science, technology, engineering, and mathematics
(STEM).” https://unesdoc.unesco.org/ark:/48223/pf0000253479

[2]OECD, 2015. “Programme for International Student Assessment (PISA) Results from PISA 2015 – Colombia Country Note”. https://www.oecd.org/pisa/PISA-2015-Colombia.pdf

[3]Ibid.

[4]UNESCO, 2017. “Cracking the code: Girl’s and women’s education in science, technology, engineering, and mathematics
(STEM).” https://unesdoc.unesco.org/ark:/48223/pf0000253479

November 01, 2019