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**Timeline**

2017

**Sample Size**

294 schools (2,954 children)

**Research Implemented by IPA**

Yes

# The Effects of Interactive Radio Instruction for Science Education in Paraguay

## Abstract

In Latin America, student achievement in science is lower than the global average. A promising method to improve educational quality in rural, low-resource areas is “interactive radio instruction” (IRI), a standardized curriculum of recorded lessons that solicit student participation. Building on the positive results of other IRI programs, researchers in Paraguay are evaluating the learning effects of an IRI curriculum for early childhood science education.

## Policy Issue

Test scores show that students in Latin America lag behind the rest of the world in math and science skills. To address this gap, some organizations are experimenting with innovative educational programs as an alternative to rote learning and memorization. For instance, an individualized math preparation program in Peru led to significant improvements in student learning, particularly among students who were struggling the most. Likewise, the government of Paraguay has had some success in improving early childhood math readiness through the use of interactive, standardized audio lessons – an approach that was evaluated by IPA and subsequently scaled up by the Ministry of Education. Now, researchers are evaluating if a similar method can improve the quality of early childhood science education.

## Context of the Evaluation

Globally, Paraguayan students ranked in the bottom third of average test scores in science, according to a 2015 assessment.<sup>[1]</sup> Within Latin America, Paraguayan students consistently underperform on math and science skills, with more than half of third-graders not achieving basic grade-level competency.<sup>[2]</sup>

This project was inspired by the success of Paraguay's "Big Math" program--a series of daily, interactive "pre-math" lessons designed to be used in classrooms regardless of teachers' preparation or pedagogical skill. Following positive findings from an IPA evaluation of Big Math, the Ministry of Education and IDB are exploring a similar approach for early childhood science education.

The project took place in Caaguazu department, which is located east of Paraguay's capital, Asunción, and is one of the poorest departments in Asunción.

## Details of the Intervention

Researchers partnered with the Paraguay Ministry of Education and Culture and the Interamerican Development Bank to evaluate the effects on student achievement from an interactive radio instruction (IRI) curriculum for early childhood science education. The curriculum is designed for children who are age 5-6 and enrolled in pre-K.

Two hundred eighty-nine participating schools in the Caaguazu department were randomly assigned to one of two groups:

- **Program group:** Received the IRI curriculum materials and training and how to use them (147 schools)
- **Comparison group:** Not offered the program at the time of study (147 schools)

IRI is an education system that combines recorded broadcasts with active learning to improve educational quality and teaching practices. IRI programs require teachers and students to react verbally and physically to questions and exercises posed by radio characters and to participate in group work, experiments, and other activities suggested by the radio program.<sup>[3]</sup> While the method is commonly referred to as "radio" instruction, IRI can be delivered via a variety of recorded media, including CDs or MP3 files.

For this science education program, participating teachers were given the audio materials and trained in how to deliver them in the classroom. The recordings covered all topics in Paraguay's national science curriculum, emphasizing a problem- and inquiry based learning approach. Additionally, the IRI curriculum was designed to involve parents through supplementary activities outside the classroom.

Researchers measured participating students' learning outcomes before the introduction of the program in early 2017, and six months later, after implementation had concluded. Researchers evaluated student achievement through a standardized test on science

knowledge.

## Results and Policy Lessons

Study in progress, results forthcoming

## Sources

[1] OECD, “Pisa 2015 Results in Focus”.

<https://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf>

[2] MEC (Ministry of Education and Culture). 2010. “Informe preliminar SNEPE.” Asunción, Paraguay.

[3] <http://blogs.worldbank.org/edutech/iri>

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