First global study confirms widely held practices on science, math, and reading education

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It's a long held belief that parental and administrative support helps breed academic success; now there's data to back that up. A new study released today by the IEA and the TIMSS and PIRLS International Study Center at Boston College examines what makes up "cultural educational excellence" while quantifying the strengths of best practices at school, and at home.

"The data supports many long held beliefs about good ways of raising your children and preparing them for school," says Dr. Michael Martin of Boston College, co-executive director of TIMSS and PIRLS and the study's co-author. "The analysis focuses on, 'How does that work, what's behind that?' There's never been data to do this, to show this mechanism, this path."

The study, titled TIMSS and PIRLS 2011: Relationships Among Reading, Mathematics and Science Achievement at the Fourth Grade – Implications for Early Learning, is the first report looking at the issue of cultural excellence – what parents, schools, and students are doing to improve success in reading, math, and science. Researchers used data from 180,000 students, 170,000 parents, 14,000 teachers, and 6,000 principals who participated across 34 countries.

"This is the biggest and most comprehensive set of data at this grade level - fourth grade 10-year olds kids - by far," says Dr. Martin. "There's

never been data from so many countries on such a level of achievement – really good measures of mathematics, science, reading achievement – really good background from questionnaires to the parents primarily, which was a good resource, but also from the school principals, teachers, students themselves, data from all of these sources. There's never been a set of data like this.

While researchers found each country has a unique approach towards education, the data also pointed to across the board similarities in school and home that affect achievement.

"The culture of educational excellence starts in the home," says BC's Dr. Ina Mullis, co-executive director of TIMSS and PIRLS and the study's co-author. "It follows with a school that has a focus on educational success by all the parties concerned – the teachers, the administration, the parents, the students themselves. It continues into the classroom with a teacher that is holding student engagement. We know then we will have students in the end that have a higher achievement, a higher motivation, and actually I think have a higher probability of becoming life-long learners."

"Obviously well educated parents tend to buy lots of books, tend to engage in activities with their kids tend to read to them, do literacy tasks and numeracy tasks," adds Dr. Martin. "Those kids, when they begin school, are able to do these things. They know what a book is, they can do their ABC's, they can read, even when they start. And of course, that's a huge, huge boost to their achievement in school. They never lose that advantage, they start school with an advantage and they never lose it. So we were digging into how that advantage comes about. What the mechanism of this is. It all starts at home and this isn't news, but the amount of data that we have on how it works I think is new."

More than half of the 34 participating countries were able to get 90% or

more of fourth grade students to a basic level of proficiency in reading, math, and science (though the U.S. wasn't included in this study, 98% of fourth graders reached basic proficiency in reading in 2011, 96% in math and science) while five countries saw 35% of their students reach a high level of achievement in those subject areas.

"For many years we've known that kids from homes of educated parents, with lots of reading materials will do better in school in the fourth grade," says Dr. Martin. "But we have really good data at TIMSS and PIRLS, reports from parents, about not only on the materials they have in the home but the literacy activities they engage their children with – numerous activities—and their estimate of just how competent the kids were in being able to read and write, and do basic things when they began primary school. And then from an assessment result we have what they can do in the fourth grade."

The study also underscored the across the board advantages of being a better reader.

"The effect of concentrating on these literacy activities also enhanced student achievement in mathematics and science," says Dr. Mullis. "We found that as the amount of reading increased, the students who weren't very good readers had more and more difficulty with the math and science items. Reading is crucial to success in school. It's the glue that's holding it together. "

Provided by Boston College