

Early numeracy intervention for first-graders

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At school reopenings due to the Covid-19 pandemic, teachers need a way of quickly assessing first graders for retained math knowledge. Here Refilwe Ntsoane, Head of Department Foundation Phase, is testing a first grader for maths skills at the Funda UJabule school in South Africa. The teacher training and education research school is operated by the University of Johannesburg in Soweto. Teachers can see which first graders are struggling, and where to help them, with an accurate, evidence-based, diagnostic test. A 15-week "maths boost" intervention program linked to the test, provides teachers good instructional material to support children in an efficient way. The study by researchers from the University of Helsinki and the University of Johannesburg has been published in Early Childhood Research Quarterly. Credit: Jan Potgieter, University of Johannesburg

Six-year-olds can't really talk to adults about the problems they may experience with mathematics. It is hard for teachers to know for certain who is keeping up and who is lagging, says Prof Elizabeth Henning from the University of Johannesburg.

The teacher could be facing 45 or even 60 little faces in the classroom, she says.

Some children may appear to cope after a few weeks' [school](#) holiday or closures due to COVID-19. But early childhood teachers need to understand what children remember and what may have been forgotten. School reopening is a good time to find out where everyone is with [math](#) and reading, she continues.

Henning is a South Africa research chair of the country's National Research Foundation.

"When kids come to school, even for [first grade](#), you don't know what they already know. At home they may have learned to recite number words and use them as if to state 'how many,' but that does not mean that they understand number yet," says Henning.

"They see their care-givers bake and cook and clean. Some children are sent to the shops before they can read. They learn some maths at home—but every home is different," she says.

Many kids learn this basic math in their home languages.

"Then they come to [elementary school](#) and 'parallel track' if this school teaches through medium of English. They start learning the same concepts in a new language, which in South Africa is mostly English.

"When the first grade teacher doesn't know the home languages of the young learners, they can't translate or code switch when they see the kids struggling," says Henning.

Prof Henning is one of the researchers in the study who adapted a Finnish evidence-based test for first graders in South Africa.

In South Africa many kids learn in English at school, but most speak a variety of African languages at home.



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provides teachers good instructional material to support children in an efficient way. The study by researchers from the University of Helsinki and the University of Johannesburg has been published in *Early Childhood Research Quarterly*. Credit: Jan Potgieter, University of Johannesburg

The test itself is not unique, but measuring numeracy and other relevant control measures in school-based intervention is, says Prof Pirjo Aunio. Aunio is from the Department of Education at the University of Helsinki.

She is corresponding author of the study, and one of the lead designers of the original Finnish test and the 15-week 1-hour-a week maths boost program for first graders. The study has been published in the [*Early Childhood Research Quarterly*](#).

"The most important result in our study was that the intervention group, those children who had extra practice in early numeracy skills with the 15-week program, had a bigger and sustained increase in their numerical relational skills, compared to children who followed business as usual instruction," continues Aunio.

"The effect was not a result of better language or executive functions skills, nor kindergarten attendance, but because of our intervention program," she says.

"What made me extremely happy is that this program's materials are cheap and easy to use. So the program is potentially very useful on a large scale as well," says Aunio.

The study provides an unusual follow-up view of first graders' progress in basic numeracy, says Henning.

"We found out how reliable the test is because we tested the first graders at the beginning of their school year, again after the 15-week maths boost program and again a few months after they completed the maths boost. Children learning in English as a second language are especially responsive to the test," she says.

"Many kids get lost to mathematics and science in middle school. But it doesn't have to be that way," says Henning.

"Far more students can arrive at middle school with the foundation needed to graduate from high school with good math scores," she says. That means more students can go onto college for technical, business and engineering careers.

The foundation starts in first grade, when the teacher digs deep to find out what is at the bottom of the kids' math knowledge, so that she can teach with different individuals' math competence in mind. One way of doing so is to test the kids at the beginning of the school year with a reliable test, such as the one in the study.

Says Henning: "We like this [test](#) and 15-week intervention program because they are easy to use and they work. With a sturdy foundation in first grade, teachers in other grades can build on it in a systematic progression. But if the early building blocks are missing, it is very hard to catch upon maths lost early on."

More information: Pirjo Aunio et al, An early numeracy intervention for first-graders at risk for mathematical learning difficulties, *Early Childhood Research Quarterly* (2020). [DOI: 10.1016/j.ecresq.2020.12.002](#)

Provided by University of Johannesburg

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